BROOKLYN BOTANIC GARDEN

PLANTS & GARDENS

BROOKLYN BOTANIC GARDEN RECORD

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1950

Flowering Trees

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Styrax japonica

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Harold H. Costain

Flowering Cherry Blossoms

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Spring 1950

EVERY STREET A GARDEN — what an America this would be if thousands of towns and cities started campaigns for planting flowering trees, not just in parks, but along the streets and by-ways. Every street a garden is a goal worth working for. Some tree planters will contend that many of the flowering trees are not long-lived, but who are we to presume to plant for too many generations to come.

There are flowering trees for almost every need. It makes little difference whether the climate is warm or cold, the soil poor or rich, acid or alkaline, the rainfall sparse or abundant, or the atmosphere clear or smoky. Cleveland, Ohio, is a large city with a flowering-trees-for-city-streets program already well under way (p. 17), and numerous small communities started many years ago. Reports have it that towns in Florida and California have done better than those in colder climates. Some of the parkways in different parts of the country have made good use of informal plantings of flowering trees.

For geographic range: the flowering dogwood seems happy enough whether in Florida or Maine, and many other trees tolerate a wide range of climate.

For botanical interest: about 20 different families of plants that grow in the United States have one or more genera of flowering trees (p. 32).

For bloom 6 to 8 months of the year: select carefully from the nearly 150 different kinds of trees mentioned in this issue of PLANTS & GARDENS.

We welcome Guest Editor Donald Wyman of the Arnold Arboretum, and the authors he has invited to write with him. They deal authoritatively with a subject that we think will interest readers everywhere.

George S. Avery, Jr.

Director

MAGNOLIAS

Aristocrats of the flowering trees

Clarence E. Lewis

MAGNOLIAS, plants many people would place in the plant social register if such existed, are thought of as a rather small group. In reality there are thirty-five species in Eastern Asia, the Himalayas and North and Central America. Many species and varieties are obtainable from commercial sources in this country but such Asiatic species as *Magnolia soulangeana* and *M. stellata* and their varieties seem to be most popular. The only other member of the Magnolia family whose name would be familiar to the average gardener is the

Harold H. Coste

Saucer Magnolia (*Magnolia soulangeana*) blooms before the leaves appear

Tulip Tree, Tulip Poplar, Yellow Poplar or White Wood (*Liriodendron tulipifera*). This is one of our tallest eastern growing trees and is noted in the dense woods for its long straight trunk which in some instances may be without a side branch for the first one hundred feet.

Paleobotanists tell us many interesting things about the true magnolias for at one time they thrived in the now frigid regions of Siberia, Northern Canada and even the broad expanses of Greenland. This was before the Ice Age when temperatures in these regions were much milder. It is said too that some Asiatic species may have once flourished in North America and evidence from fossils is brought forward to substantiate such claims.

Growing Requirements

Magnolias are often particular about their growing requirements. The fleshy root system suggests that they be transplanted while the plant is active which would be as soon as the flower petals of the Saucer Magnolia (*M. soulangeana*) have fallen in the spring. Late August or September has been a satisfactory time

Star Magnolia (*Magnolia stellata*), the earliest to bloom, used as an informal hedge

Saucer Magnolia (*Magnolia soulangeana*), a shrub-like tree about 15 years old

in mild regions too. The reason that it is difficult to transplant them during the dormant season (December 1st to April 1st) is that if a fleshy root is badly injured it may not recover. Frayed roots should be cut cleanly, and bark injury too should be avoided since it may seriously affect their survival.

Members of the Magnolia family are susceptible to the ill effects of any prolonged dry spell. Because of this, soils where magnolias are to be planted should be well supplied with organic matter so that there will be a ready supply of water, and soil testing is frequently resorted to for this purpose. If it is recommended that organic matter be added it might be applied in the form of finely granulated peat moss or woods humus. If a continued dry spell sets in, such as that of June and July of 1949, watering is a necessity. A light sprinkling is not enough for soils of a sandy nature, particularly with gravelly subsoil. Under such conditions an all night sprinkling twice a week is none too much.

While the soil is being tested a check might be run on the soil acidity, for magnolias do better in acid soils, preferably with a pH of about 5.5. The native Sweet Bay, (*M. virginiana*), has been known to react favorably to soils that test below 5 pH, but this is not recommended for most species. All magnolias should be balled and burlapped in transplanting, and none should be bought with only bare roots.

Diseases

Insects and diseases usually affect only those plants that are in a weakened condition. Magnolia scale is a brown shiny scale which shows a white waxy coating in late July or August. This can be controlled with a dormant oil spray in late winter (February and March) and again two or three weeks later if the infestation is heavy. The large scales may be removed with a stiff brush in the summer. Wood decay or die-back sometimes occurs, the best control of which is to keep the plants in a good vigorous condition and to remove all branches showing any drying whatsoever. There are occasionally a very few cases of leaf blight for which there seems to be no complete control.

How to Use

The magnolias best adapted to landscape planting are *M. soulangeana* and its varieties, *M. denudata*, *M. stellata* and its varieties, *M. sieboldi*, *M. virginiana* and possibly *M. cordata*. Some of the native species like *M. macrophylla* and *M. tripetala* are not desirable because their leaves are too large and coarse for most planting in the small home grounds. Magnolias are suited to the small home grounds when the house is built of coarse material such as large stone or broad clapboards. The Star Magnolia and Sweet Bay offer no problems, however, since their leaves are smaller than most of the other species. As lawn specimens near the outer edges of the house on plots that have a seventy-five foot frontage or more, and in park plantings

Flower and foliage of the Cucumber Tree (*Magnolia macrophylla*)

(where water is obtainable) magnolias are used at their best.

Varieties

Magnolias are generally divided into two groups: (1) those that flower before the leaves and (2) those whose flowers appear after the leaves are formed. Most Asiatic species are in the first group, hence are more conspicuously attractive than the others and are certainly more widely known.

The pure white Star Magnolia (*M. stellata*) is usually of a shrubby nature and takes many years to reach a height of ten or twelve feet. This Japanese species is hardy and will flower well in the metropolitan area during mid-April, the flowers being three inches across and having over a dozen narrow white petals. The variety, *rosea*, is even slower growing and displays a pinkish tinge to the outside of its petals.

The Kobus Magnolia (*M. kobus*) has flowers resembling the Star Magnolia, but has fewer petals. It is either shrubby or tree-like and may reach a height of thirty feet or more. This species makes the best understock upon which to graft other species and varieties and is widely used for this purpose.

The Saucer Magnolia (*M. soulangeana*) is a hybrid between *M. denudata* and *M. liliflora*. This species includes the greatest number of varieties, many of which are obtainable from nurseries. The blooms come soon after the Star Magnolia in late April or early May. Probably variety *lennei* is the best known and most widely used, because of its saucer-shaped flowers that are white within and rose-purple on the outside. It has a tendency to be shrub-like. Other easily obtainable varieties include *rubra* (rose-red flowers), *alexandrina* (white flowers shaded purple at the base), *spectablilis* and *alba* (both white to near white).

The Lily Magnolia, *M. liliflora*, is not usually hardy north of Philadelphia although occasionally it exists in sheltered areas. The variety *nigra* with large purple flowers on its five- to eight-foot frame seems to be hardier than the species.

The Chinese, Chandelier or Yulan Magnolia (*M. denudata* or *conspicua*) is very similar to *M. soulangeana* in size

H. Howard photo

Flower and foliage of the Ear-leaved Umbrella Tree (*Magnolia fraseri*)

(20 to 30 feet) and habit. Its creamy-white flowers are also saucer-like but appear in an abundance soon after those of *M. stellata*. This is a fine magnolia, unfortunately too frequently overlooked in preference to *M. soulangeana*.

The Oyama Magnolia (*M. sieboldi* and *parviflora*) should also receive more use. Its white flowers with scarlet stamens appear in June and make it a welcome addition to any garden. It has a habit similar to that of the Saucer Magnolia but is of shorter stature with smaller leaves. Other Asiatic species that can be grown in areas comparable to the Metropolitan region but difficult to obtain from commercial sources are *M. watsoni, obovata, wilsoni* and *salicifolia*.

Of the native magnolias probably the Evergreen Magnolia, Great Laurel or Bull Bay (*M. grandiflora*) is best known. It is very difficult to grow in the region about New York City although a large one exists in Brooklyn and a fine espalier is growing on the wall of a Princeton University building. It is not advisably used north of Washington, D. C., unless merely given a try in a sheltered spot. In the South, it becomes a magnificent pyramidal tree of some eighty to ninety feet, with white waxy flowers of lemon-like scent in May, as clean and white as any flower of the myriads grown in the garden.

Two of the large leaved types, both with large greenish white flowers, are the Bigleaf Magnolia (*M. macrophylla*) and the Umbrella Magnolia (*M. tripetala*). The leaves of the former often measure three feet long while those of the latter may be up to thirty inches. They are frequently confused but can be readily identified by observing the leaf bases, the Bigleaf Magnolia being rounded or cordate while the leaf bases of the Umbrella Magnolia are tapering. The stems and end buds of *M. tripetala* are smooth while those of the large-leaved magnolia are quite hairy. Both are reasonably hardy, but difficult to use because of their coarse texture in foliage and flower alike.

The Cucumber Magnolia (*M. acuminata*), native of the eastern United States, often reaches heights of 75 feet or more, even in the northern area. This is probably the hardiest of the magnolias and can be found in the colder parts of upper New York state. The Yellow Cucumber Magnolia (*M. cordata*) thanks to Michaux's eighteenth century discoveries in Georgia, is finding its way into nurseries. The very beautiful yellow flowers of early June are welcome additions to many large lawn plantings. It may reach a height of twenty-five to thirty-five feet although there are southern specimens that are at least seventy-five feet high.

The Sweet Bay (*M. virginiana* or *glauca*) is found in wet areas near the coast from Massachusetts to Florida. It may be shrubby or tree-like but is generally shrubby in the northern regions. The rhododendron-shaped leaves are silvery on the under surface and persist into late fall. The waxy white flowers of

June and July are superbly fragrant and make this one of the best of the native magnolias for landscape use.

It requires more moisture than most any other species and is usually planted in swampy areas. One more native, the Fraser Magnolia (*M. fraseri*), is another large-leaved type the foliage of which has a fresh green appearance. This is one native species that nearly gets its sweet-scented flowers open before the leaves appear.

The fruits of many of the species are interesting with their cucumber-like appearance when green, and then the small slits on the side through which appear the brilliant red to orange coverings of the seeds. They are coarse and large, do not remain on the tree for long once they are ripe, but certainly add to its fall interest from an ornamental point of view. All magnolias are interesting and can easily be considered true aristocrats of the plant world.

Gottscho-Schleisner

Magnolias create a charming picture with an evergreen background

FLOWERING ORCHARD TREES

. . . have certain limitations

Charles H. Connors

AN APPLE tree in bloom, hanging over a white picket fence surrounding a yard in which our dream cottage is located: this is the picture that is in the mind of many an individual as he contemplates a peaceful, happy home away from the maddening crowd. Then we read newspaper stories of the peach blossom festival in New Jersey, the apple blossom festival in the Shenandoah Valley, the cherry blossom festival in Wisconsin, and more and more we yearn for these beauties in our own gardens. And we may even think of the fruits that succeed the flowering.

This yearning, however, must be tempered with common sense. The far view is always the best. Perhaps it would be wise for us to obtain such views on someone else's property, because a realistic consideration of the subject may show the impracticability of having these things and a garden too.

One of the bars to the use of such plants on small places is space limitation. A standard apple tree requires and will fill, in a few years, a space about 35 to 40 feet in diameter. And in the case of the apple, we cannot secure fruits unless two compatible varieties are present to provide cross-pollination. Sweet cherries cover about 25 feet in diameter, pears 25 to 30 feet, plums 18 to 25 feet, and two varieties of each of these are needed for fruit production. Peaches are usually 20 to 25 feet in diameter at maturity and most of the commonly grown varieties are self-fruitful, that is, fruits will be produced upon a solitary tree.

It readily can be seen, then, that to have standard fruit trees on a small place will mean that within a few years after planting, the area desired for the cultivation of garden flowers will gradually decrease, not only because of shade cast but also because of competing roots. Fruit trees must be cultivated and fertilized to keep them going.

Another limitation is the need for spraying. Unsprayed fruit trees can become a tremendous nuisance because of falling fruits that are insect infested or disease infected. They clog lawn mowers and are messy underfoot. While it is not necessary to spray home orchard fruits as frequently as is necessary for production of marketable fruits, nevertheless some spraying should be done. For example, as many as ten sprays, and sometimes more, are necessary to produce saleable apples. The home orchardist can obtain fairly satisfactory results with three to five sprays. However, it is really necessary to have available power spraying equipment to make proper application. Especially with stone fruits, such as peach, plum, cherry, and usually on apples, summer sprays containing sulfur are necessary, and the drift from such sprays has a serious effect on painted surfaces. White paint turns black.

Time must be available, too, for cultivation, for pruning at the particular season best adapted, for spraying. And the time of applying sprays is vitally important, for a day or two too early or too late may result in the failure of the crop.

Climatic limitations are broad. The soil must be well drained, even more so sometimes than for garden flowers and ordinary shrubs. Air drainage is important, for often fruit trees planted at low elevations or where frost pockets will form will often lose their fruit blossoms as a result of freezing or frost injury. There must be adequate rainfall. Free-

Apple blossom time

Gottscho-Schleisner

Richard Averill Smith

Apple tree—ten years from the nursery

Author photo

Espalier Apples bordering a path and screening vegetable garden

dom from the smoke and dusts of industrial cities is essential for good growth.

Now that that is out of the way, let us see what can be done about it.

First there is the matter of dwarf trees. The most successful of these is the apple, because in the propagation of apples a dwarfing apple stock is used. This fact in itself makes particular care necessary. It is advisable to plant these against a fence, on a trellis or fastened to a stake. Moreover, it is advisable to plant them in such a way that the point of union where the top desirable variety was inserted in the stock is several inches above the ground. If planted with the point of union at or below the surface of the ground, in time the top part will form roots of its own and then it will become a standard tree. The remedy, in this case, is to excavate about the union each year and remove any roots that may have formed. With dwarf apples, too, it is necessary to have more than one compatible variety in order to secure fruits.

Where the climate is suitable for the growing of pears, we can secure them as dwarfs on quince stock. The chief limitation to growing pears is the bacterial disease known as fire-blight. This may cause the death of one or more branches and even of the whole tree. There is no easy control for this disease.

Peaches may be secured as dwarfs on plum stocks and plums on dwarf plum stock. In the case of both peaches and plums, the peach tree borer must be controlled. This insect tunnels into the tree at or below the soil level.

More attention must be paid to pruning and training dwarf fruits than is necessary with standards. The framework must be formed and then maintained. Exuberance of growth must be restrained and as much flowering and fruiting wood encouraged as the particular plant can carry.

While it is better to keep the soil around such trees under clean culture, we can plant up to them, provided we make sure that enough fertilizer is applied and in such a way as to take care of the needs

of the trees as well as what is planted near them. This would imply using a crowbar or some other means of getting the fertilizer down into the region where the tree roots will have first call on it.

Another point of concern with apples is the fact that many varieties produce flowers and fruit every other year. A few varieties, such as Wealthy and Rome, usually bear some crop every year. Usually this characteristic is general even in an orchard. However, variations may occur. We once had a tree of the variety Gravenstein (which is showy in bloom and produces fruit of good quality) that somehow or other got out of stride. A segment of the tree, about one-third, produced blossoms one year, the remainder of the tree being green. The next year, one-third was green and two-thirds bloomed. An upset in physiological balance may throw a tree off stride. In the case of dwarf trees this is less likely to occur. The detailed attention that needs to be given to training and pruning is more on the side of maintaining physiological balance.

Dwarf trees may be used on fences or trellises to define the boundaries of sections of the garden area, in the form of cordons or espaliers. A blank brick, stone or concrete wall facing south may be hidden by an espalier trained fruit tree, provided means are taken to protect nearby painted surfaces when spraying with sulfur.

On small properties, it would be wise to forget standard trees of orchard fruits and turn to substitutes. Many of the flowering crab apples form trees that are not very large and would serve as a feature tree in a corner in a paved area. These plants are conspicuous in bloom and have the additional merit of producing fruits, usually without attention to spraying. The fruits are edible and generally useful in making jelly. Some also supply food in winter to some birds.

Another group of trees that may serve as feature trees are the more upright growing varieties of Oriental flowering cherries. These furnish bloom and shade for a small area although they generally produce no fruits.

THE BEST TREES

Do not let yourself be overwhelmed by the beautiful flowers of certain trees, particularly if the flowers are all they have that is ornamentally outstanding. Especially is this true if the space is small and only a few trees can be used. There are other seasons of the year, when the trees are not in flower, that they should present something of interest in the landscape—this is just as important as spring flowers.

There are trees, like the Flowering Dogwood, the southern Sourwood, and some of the Crab Apples, Magnolias, Hawthorns and Shads (and others too), which not only have interesting flowers, but brilliantly colored fruits as well. In addition they are blessed with a vivid coloration of their foliage in the fall, especially if they are planted where they are exposed to full sunshine. Even the form of a tree can have considerable interest in the winter, after fruits and foliage have fallen.

Such trees are always of interest, and should be given preferred positions in the garden so that the changing of colors can be appreciated throughout the entire year. Consider carefully the merits of each tree before it is finally selected. Does it have beauty several seasons or only one?

THE ACACIAS OF THE FLOWER SHOWS

Stewart Johnson

ACACIAS are prominent plants in the scrub areas which cover thousands of square miles of the arid interior of Australia. They are noted for their fragrance and beauty of flower. In Australia, "Wattle" is the name generally applied to them, and the different "Wattle" blossoms are the state floral emblems. More than 400 species of Acacia have been described from there, and they can be found in every state, from the coast to the interior, in swamps and on dry mountain slopes, on river banks and on dry plains. In size, they vary from tiny shrubs to gigantic trees one hundred feet tall.

In the northeastern United States Acacias are grown only in greenhouses (of course being hardy in the subtropical areas) but during the cold and gloomy parts of late winter when they bloom, the great variety of foliage, both in form and color, makes the Acacia one of the most beautiful of all plants. Every shade of green, from the palest to the darkest, can be found in the foliage of some member of the Acacia family. It is chiefly in the great flower shows that these beautiful plants come into their own (in the East) and cause so much comment. Since many grow into trees in their native habitat, a very few are discussed here, to let the home owner into a few of the secrets of growing them successfully under artificial conditions for display in our northern cities.

The original Stone collection of Acacias (at Marion, Massachusetts), consisting of sixteen plants, and fourteen varieties, was purchased from the late Thomas Roland of Nahant, Mass., in 1924, but since that time, these plants have outgrown the greenhouses and have been discarded. During the past 25 years, through propagation from seed and cuttings, we have increased the collection to twenty-four varieties, each one being slightly different in habit of growth, flower or foliage, than the others, making it the best display collection grown under glass in this country. All the varieties that we grow are native of Australia, and at the present time there are approximately three hundred plants, ranging from a 4-inch pot size to an 18-inch tub size.

Seeds sown in January will grow into plants in 3-inch pots by the end of the first year, after which they will grow quite rapidly. It is a good idea to soak the seed at least 24 hours before sowing. The month of October is a favorable time to put in cuttings, and if placed in pans of sand in a temperature of about 55°, they should root easily in from 8 to 12 weeks, depending upon the variety.

The Pearl Acacia (*Acacia podalyriaefolia*) is the first to bloom, usually at Christmas, then *A. baileyana* and *A. decurrens dealbata* in January; the other varieties bloom from the latter part of February until the latter part of April. Many of the varieties can be kept in bloom for six weeks by keeping them heavily shaded and cool.

If the plants are to be exhibited, a temperature of 42° at night is maintained during the winter months, and six weeks before the Flower Show the late-blooming varieties are moved into a warmer greenhouse and kept at a 55° temperature. Sunshine is the greatest factor in bringing the plants into bloom, and it often happens that a week of cloudy weather will prevail, then we raise the temperature up to 65° at night. As soon as the plants are about one-quarter

P. E. Genereux

Acacia display at a Spring Flower Show

in bloom, we return them to the cool house, which, in the meantime, has been heavily shaded as soon as the plants in there begin to flower. There have been years when the Flower Show has been held a week or two earlier than usual, and the weather has been cold and cloudy, so that we have had to use six greenhouses, with temperatures ranging from 38° to 65° at night in order to have all the plants in proper condition for the Show. There is one asset an Acacia has that very few plants have—a sudden change of temperature does not seem to harm them in the least. There have been times when we have taken plants from a 42° house into a 65° house and kept them there two days until the buds burst open, then we have returned the plants to the cool house again without any ill effect to the plants whatsoever.

The transportation of the plants to a Flower Show is not half as difficult as many people think. We use trailer vans, and the plants that are too tall to stand erect are tipped over and the tubs placed in wooden frames which are secured to the floor of the van, then the plants are tied so they cannot move in any way. The smaller plants are packed in, practically tub to tub, and all arrive at the Show without any damage.

When the plants are through blooming, they are pruned into shape and sprayed with a good insecticide and are sprayed every ten days, which keeps off all scale and aphids. On sunny days they are syringed four or five times a day which keeps away red spider, a dangerous pest to all Acacias. The house is sprayed on the outside with a thin coat of shading material and the temperature kept at 55° at night until the plant develops the new growth, after which all air possible is given them. When the new growth has developed about 2 inches, the plants are checked for potting or tubbing, and the fast-growing varieties, such as *Acacia longifolia,* are repotted every year, while *Acacia pubescens* will grow perfectly for at least five years without tubbing.

The plants that are not repotted are given an application of a good organic

fertilizer every two weeks. The compost used in repotting consists of 3/4 sandy loam, 1/4 cow manure and a 4-inch pot of bone meal to every wheelbarrow of compost. When the plants have made a growth of about 6 inches, every shoot should be pinched, which keeps the plants bushy and compact for display purposes. The fast-growing varieties should again be pinched when they make another growth about 6 inches long. By October the feeding of the plants should be discontinued so that the wood will ripen and develop flower buds.

Acacias will not survive planted out in areas where freezing temperatures occur but they do thrive in a climate such as that of southern California. For anyone who has greenhouse space available where Acacia plants can be grown under proper conditions, or for persons with areas in their houses where the plants can be grown properly, the Acacia is well worth growing for the beautiful flower and its lacey foliage give a cheery introduction to the Spring season. Their conspicuous display at Flower Shows in spring always causes comment by the thousands viewing them. This abbreviated attempt at showing how they are forced in the greenhouse for display proves that not many can grow them without the proper facilities, but they certainly are among the most beautiful and graceful flowering trees and shrubs in the world.

THE SCARLET EUCALYPTUS

The Scarlet Eucalyptus (*Eucalyptus ficifolia*) is a brilliantly flowered tree, native in western Australia and much used in southern California as an ornamental. It grows about 40 ft. tall, has a densely rounded habit, and its showy blooms appear in January and February, appearing sporadically in September and October. There are some trusses which may bloom at almost any time of year. This is a very popular tree where it can be grown untouched by frost, but, on occasion, can prove most disappointing too. When trees are grown from seed, care should be shown in selection, if only scarlet flowered trees are wanted, since seedlings may give white, pink or orange-red blossoms as well as scarlet. The dried fruit pods are interesting as are those of most Eucalyptus. It withstands some heat, a little drought, but practically no frost. A brilliantly colored flowering ornamental, for southern California, it is never forgotten once it is seen at the height of bloom.

THE EPAULETTE TREE

This rare but beautiful tree (*Pterostyrax corymbosa*) is hardy on Long Island and deserves to be better known. Watch for a feature article in a forthcoming issue of PLANTS & GARDENS.

FLOWERING TREES FOR CITY STREETS

Streets can be gardens

Edward H. Scanlon

A BROAD view of street tree planting in this country, specifically the sections not tolerant of tropical and subtropical trees, indicates that a quite provincial and unimaginative philosophy has prevailed these many years—a philosophy that has ignored the use of flowering trees.

Street embellishment with trees is just beginning to be appreciated in the realm of city planning as a badly abused, misused and, in too many cases, an overlooked opportunity for the creation of values and atmosphere that no other material can impart. In the opinion of the writer the recent concern by public officials and civic groups in the matter of declining street tree values, has been brought about by the almost colossal mistakes made in the field during the past fifty years—and which are continuing today.

Why these mistakes were committed can be attributed to several basic misconceptions of the problem. These misconceptions go round and round involving such factors as smoky atmosphere; restricted planting conditions; soil compaction; failure of nurseries to grow *street* trees; lack of a profound knowledge of dendrology; inadequate evaluation of the problem; insufficient funds appropriated by cities; subjugation of the street tree function to park needs; entrusting the work to political appointees with no training in arboriculture; public apathy, and specifically apathy of garden groups, horticultural organizations and civic clubs. But now the problem is acute; even people vaguely aware of street trees realize something is wrong. Trees are disappearing because of offenses committed and few are taking their places. It is the out-of-scale, too large trees that cause the trouble necessitating the replacement with a tree of smaller stature. One of the major faults causing these troubles in the past has been a lack of knowledge of trees.

Mistakes have been made with the species of trees in common use, and because of this we must search for and use new trees, even though in the doing we make additional mistakes. One way in which we, in the Cleveland Division of Shade

Maackia amurensis, a close relative of the handsome Yellow-Wood

McFarland photo

Black Locust (*Robinia pseudoacacia*), a variety of which (*idahoensis*) is used as a street tree

Trees, hope that our mistakes will all be "little ones" is through the use of small trees of the "tailored" variety.

Why can't flowering trees be used on streets in the east and midwest? No one has ever given the writer a sound reason against their use. It just seems that tree planters picked up where their predecessors left off—few new types have been tried. There have been few—very, very few—streets planted with flowering trees. Only one comes to mind at the moment and it is lovely and beautiful. It is Oxford Street in Rochester, N. Y., where the center strip is planted with *Magnolia soulangeana* and the sidewalk planting is American elm. There are probably several other outstanding plantings not known to the writer, but they are few and far between. California and Florida are outstanding examples of the fact that flowering trees on streets are beautiful, different and at the same time practical.

In Cleveland we are working toward having a series of streets, in all sections of the city, where flowering trees, of many species, will dominate. The only reason we have not progressed faster has been our inability to obtain suitably grown trees of the various species from commercial nurseries. Consequently, three years ago we instituted a growing program of our own, and now have over 200,000 trees in various stages of development, among which are many thousands of trees of various flowering species. Our efforts received considerable stimulation this past August when our first planting, made in 1947, burst into bloom. The trees were *Sophora japonica*, the Chinese Scholar tree, and the people along this short tree-lined street were very proud of the occasion. The Scholar tree blooms late in August, a usually dull flowering period in the midwest and east. It is profusely covered with panicles of minute, pea-like, creamy white blossoms. The tree is tolerant of smoke and most adverse city conditions, but prefers a loamy or light soil for best flowering. In the latitude of Cleveland it will hardly exceed thirty feet in height with about the same spread, and can be used on streets where not too much space is available. It should have at least a five-foot "tree-lawn." Farther south it will attain greater proportions, particularly in trunk girth and spread, and so must be used with caution except on wide avenues with generous space factors.

Another favorite, a lovely thing, is the Goldenrain tree (*Koelreuteria paniculata*). We have one short street planted with this beautiful little tree, but are growing many thousands more. In June and July the Goldenrain tree, a native of China, is covered with colorful yellow flowers and in the fall the brown seed pods remind one of a Chinese lantern plant. This tree is a small grower and probably will not exceed twenty-five feet, around Cleveland, for forty years. The tree is tolerant of smoke and city conditions generally, but like anyone, man, beast or plant, will do better under suburban conditions. One strong factor in its desirability is its drought resistance. This is important in widespread city tree planting when summer watering of new trees must be undertaken.

Lack of imagination was mentioned as a commodity that had resulted in some mediocre street planting. It must be remembered, however, that a majority of streets have narrow limitations in which to achieve any but the conventional "in-line" planting. The principal deviation in most situations would be to vary and enlarge the number of species and forms; however, occasionally an unusual combination of pleasing factors will fall together. This happened on a certain Cleveland street. It is about thirty-five feet wide; the planting strip, or as we call it, the "tree-lawn" is an amazing thirty feet, a five-foot sidewalk, and a forty-foot set-back. Such a situation would be looked upon by the devotees of the American elm as Utopia, but not by this devotee of "small treeism" for modern cities. Added to this generous space, the street makes two nice, slow curves in

a matter of about five blocks. A perfect layout for the display of flowering trees. The first thought turned to the lovely *Sophora,* but none were available.

Keeping in mind the possibility of a future widening program the planting was made in two rows. The inside row was located ten feet from the sidewalk and the trees spotted one hundred feet apart—the tree in this row was the upright form of Norway maple (*Acer platanoides ascendens*). Five feet farther from the widewalk, fifteen feet, and directly in the middle of the "tree-lawn," at one hundred foot intervals between the upright Norway, we used the Red Horsechestnut (*Aesculus carnea*). This is a beautiful tree with red, candle-like flowers that stand out against the dark rich foliage. This Horsechestnut is not subject to the leaf scorch that makes the European form so undesirable. It will grow about thirty feet in this locality. The whole picture then of this street seems a pleasant one to contemplate—the spire form of the pyramidal Norway with the lower rounded form of the Horsechestnut, and at blossom time the trees can be fully viewed by motorists as they progress down the curving street. There will be ample space on private lawns for people to plant small trees with no possibility of future conflict such as that which would result from the injudicious use of elms, silver maples, and other large species.

Plans for future streets include the Idaho locust (*Robinia pseudoacacia,* "Idaho") a charming small tree, about twenty feet high, with quite a long flowering period when six-inch pendants of lavender flowers engulf the tree. We have four streets, quite narrow ones, planted to this tree. Its wood is brittle and it is subject to borers, but a 9 per cent DDT applied just before the foliage appears has kept our trees absolutely free of these marauders. As for the brittleness, it is felt that for the beauty of the flower we can afford to be a bit extravagant if our general plan of small low maintenance trees is followed. The DDT has been equally successful on two streets of Globe-head locusts and one of Black locust. The Black is another fine flowering tree that imparts a delicious fragrance in the blooming period.

A short street of *Maackia amurensis* completes our program for flowering trees to date. This low round-headed tree from China greatly resembles the native Yellow-wood (*Cladrastis lutea*), of which we are growing a great number. The Maackia has never been used for street purposes, but has done well with us for three seasons now. It has not flowered yet, but in addition to the attractive white wisteria-like flowers it is beautiful when the leaves break in spring. They have a silvery-velvet appearance which changes to a dark lustrous green.

Two species of *Evodia, hupehensis* and *danielli,* are among our newcomers that should be ready for planting in about two years. These trees bear umbels of creamy white flowers in late August against a background of rich green leathery leaves. A lovely crab that is practically fruitless is another flowering tree we are propagating by graftage. It resembles the Eley crab in flower, rose pink, and has a quite lengthy flowering period of about three weeks. The true identity of this crab has not been established yet.

Several selections of nice clean looking upright oval forms of Hawthorn are being grown. The one objection to the Hawthorn is its rather messy fruits, particularly on sidewalks; however, we are hopeful that one of our selections which seems to be fruitless will retain that desirable characteristic. A number of Chinese magnolias are being trained to single leaders, and will some day grace at least a half dozen special streets we are reserving for these sensational flowering trees. *Halesia diptera* and *H. carolina* are both striking trees in flower. If grown properly as standards they should make nice small street trees. Both are on our list.

The field of flowering trees can be

McFarland photo

Silver-Bell (*Halesia carolina*) in early stage of bloom; see color photo for later bloom

more widely indulged in as one moves southward—the Bullbay Magnolia, the Mimosa, Crape Myrtle and many others. One needs only to study the trees available to learn that our streets and cities can be bright and attractive rather than drab and cheerless. Modern cities cannot support the large, rank growing trees of the dirt road era. We have long since moved into an era that calls for functional trees and in this category the flowering tree holds a high rank.

FLOWERING TREES FOR THE SMALL PLACE

Select with thought of the future

Ruth H. Smiley

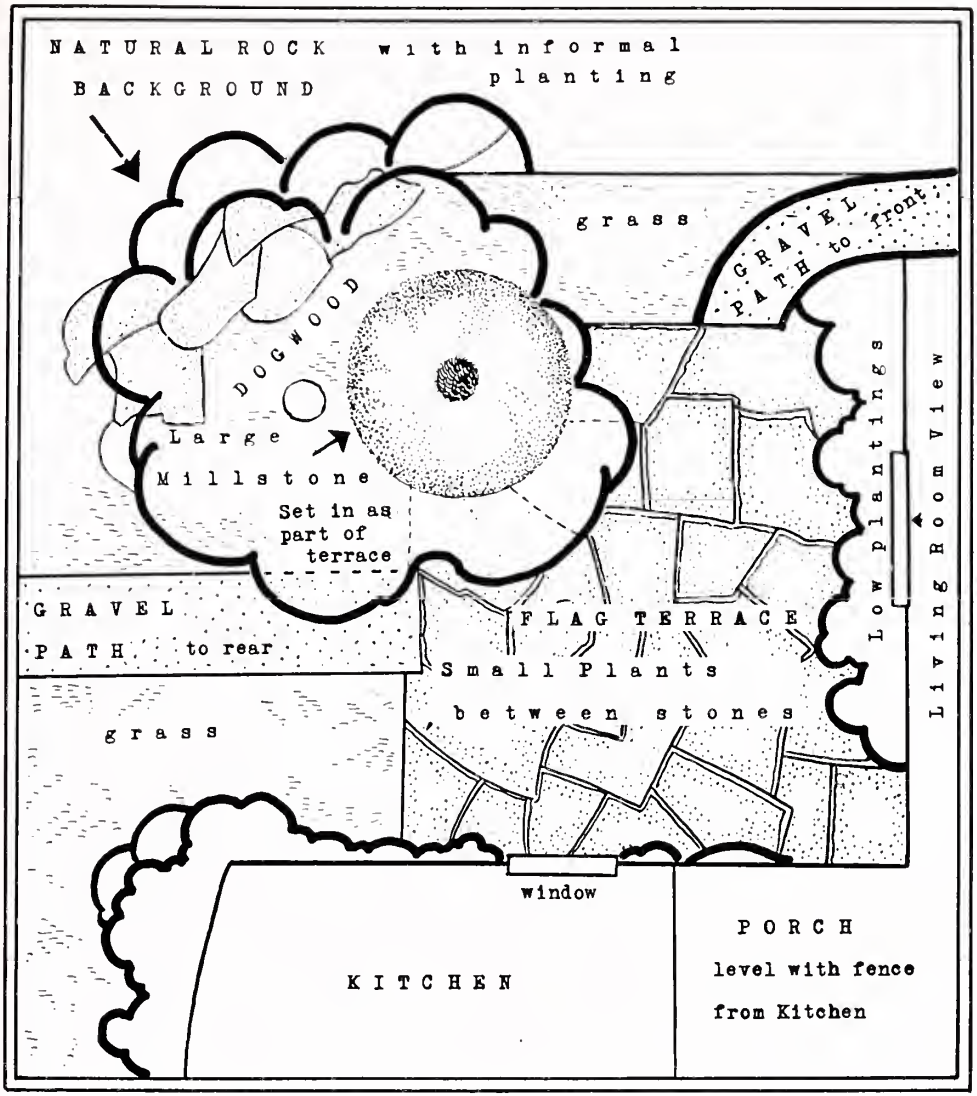
TOO OFTEN in the planting of a tree one is guided into his choice because of sentiment, a desire for shade or perhaps even by what his neighbor has planted. As a result we see such misfits as a Weeping Willow barely surviving on a dry rocky bank, or a Norway Maple providing shade, to be sure, but making the survival of all other vegetation beneath it impossible. These stimuli may all be well justified if the intention is properly directed.

With added imagination, particularly in planning the limited area, a well-chosen tree may not only be considered for its addition to the landscape plan and for its provision of shade, but also for its attractive and interesting bloom.

Some trees in the group to be discussed have been neglected partly be-

Flowering branch of Fringe Tree (*Chionanthus virginica*)

Arnold Arboretum photo



Plan for small garden to feature a flowering tree

cause gardeners do not wish to take a chance on little known introductions and partly because nurseries have not shown them to advantage. In planting trees one plants for permanence and it would be well worth the time expended in finding out all there is to know regarding a tree. Articles and catalogues on the subject should stimulate further research resulting in a visit to a nursery or Arboretum or Botanical Garden where the specimen may be seen in its maturity. On a small place it is well to limit the selections to two or three trees and choose if possible for different blooming periods.

It is with these facts in mind that the following list of flowering trees has been compiled, including only those which seem suited to the small garden.

Aesculus carnea, the Red Horsechestnut, is a much smaller tree than the Common Horsechestnut, reaching about 30–40 feet in height. It is the largest tree included in this list. The

flowers vary from pink to red. Variety *brioti* is a good red form. Since the floral interest is in June, care must be exercised in choosing a place for this red flowered tree where it will not clash with other garden colors. In planting it as a specimen or shade tree one must be mindful of the fact that the tough spiny nuts formed in the fall are a nuisance to garden maintenance. (If children are in the neighborhood, the collecting problem will be covered!)

Amelanchier canadensis has many common names including Shadbush, Shadblow, and Serviceberry. A small native tree worthy of consideration in this list for its over-all dainty loveliness. A particularly fine addition to the garden if it is situated in the suburbs where native material works in well with the general landscape picture. It is variable in height, ranging from 10–30 feet.

During its blooming season in May (they say, when the shad run upstream), it is generously laden with clean white cherry-like blossoms. Planted against an evergreen background or near a dwelling it will add much to the scene with its birch-like leaves and clean gray bark with dark stripe-markings. With the approach of fall the leaves turn to scarlet and russet. Skirted with daffodils and early violets we have a perfect spring picture.

Cercis canadensis. When once established the Redbud becomes a very picturesque tree. If planted in a protected position it will add a good deal of pleasure and much sought for early seasonal interest. The first five or six years of the tree's life are the hardest. As individuals they show to best advantage if planted with an evergreen background or near an entrance way, or corner of a dwelling. The tiny purple pea-like flowers appear in April and May looking especially well against stone architecture. The tree is of variable height depending on its location, but if allowed to spread it will reach about 20 feet in height. Pruning will encourage it to grow considerably taller. The wood of the Redbud is characteristically brittle and hence it should not be planted in open windy places.

Chionanthus virginica or Fringe Tree is a neat tree, if encouraged to develop a single trunk, of not over 15 feet in height which tolerates shady conditions. In June and July the tree becomes draped with greenish-white flower clusters which hang like fringe from the branches. The male form proves to be showier than the female. However, if fall fruit is desired and it is possible to plant trees of both sexes to insure pollination, the female form would provide grape-like clusters of blue fruit in September.

Cornus florida. No list of flowering trees would be complete without the Flowering Dogwood. It is an excellent tree for the small and large garden alike. It may be used in the small area as the major tree interest and at the same time will contribute shade, flowers and fall color. Its somewhat horizontal branching habit and its relatively small height of about 20 feet make it very adaptable to use in connection with architectural features including the dwelling itself. Planted naturally in the shrub border it is most effective.

The Pink Flowering Dogwood (*Cornus florida rubra*) is lovely, too, but not as hardy in some northern locales.

Cornus kousa—the Japanese Dogwood—is another worthy Dogwood which blooms later than *C. florida* with abundant but not as showy flowers.

Cornus mas. Cornelian Cherry is truly a harbinger of spring with its very early flowering clusters of minute yellow blossoms. Placed in front of an evergreen background or at the corner of a shrub border the masses of greenish-gold flowers are quite effective. It is spreading in its habit of growth and never exceeds 20 feet in height. The common name alludes to the beautiful red color of its fruit which appears in August, to the delight of the birds.

Crataegus oxyacantha. English

Red Bud (*Cercis canadensis*)

McFarland photo

Hawthorn is one of the most adaptable of the Thorns for use in a small garden. It grows in a rather erect form to a height of 20 feet. Although its leaves are small and deeply lobed, the dense growth makes it a good shade tree. The familiar clusters of scented white flowers appearing in May are followed by red fruit in the fall.

Paul's Scarlet Hawthorn is a variety bearing double pink flowers.

Crataegus phaenopyrum (formerly *Crataegus cordata* in most literature). The Washington Thorn should not go unmentioned because of its good erect form. In addition to its attractive white flowers and scarlet fruit it adds to the fall landscape with its beautifully colored scarlet foliage.

Elaeagnus angustifolia. Russian Olive is the only Elaeagnus to bear flowers worthy of mention. The abundant small yellow blossoms appearing in June are more outstanding for their sweet fragrance than their showiness. The silvery whiteness of its stems and leaves makes it a nice little ornamental tree which attains a height of approximately 20 feet. The small yellow fruit ripening in August has a silvery sheen and is edible.

Halesia carolina. Silverbell. In its youth this small tree is pyramidal in form but on reaching maturity (approximately 20 feet high) it develops a round top. Although it would not be planted for the shade it provides, it may be placed at the edge of a shrub border to display its spring blossoms. The white flowers gen-

Daniel Smiley, Jr.

Amelanchier along roadside in New York State

erously strung like miniature bells along the stems are a pleasing sight in spring when the tiny leaves are just commencing to break forth.

Koelreuteria paniculata. Goldenrain Tree, when used in the open to provide shade or in the border where ample space is given, develops into a neat tree of about 20–30 feet in height. Large clusters of bright yellow flowers, superficially resembling Horsechestnut blossoms, are borne in upright fashion on the branches in midsummer. These are followed in the fall by panicles of curious little lantern-like seed pods. This tree would seem to fit on a small property where shade was desired without the usual dense foliage canopy.

Laburnum anagyroides. There are many good varieties of the Golden-Chain Tree, *L. vossi* being one of the best because of its hardiness. It is beautiful in June when laden with drooping racemes of yellow pea-like flowers. It never grows much over 15 feet and may be happily planted in conjunction with architectural features having a somewhat formal line.

Magnolia glauca (commonly known as *Magnolia virginiana*). Sweet Bay Magnolia is an outstanding medium-sized tree in its maturity. Four months of continuous bloom with some periods heavier than others make it a most desirable tree for its floral interest. The blossoms are heavily fragrant reminiscent of gardenias with their creamy whiteness showing up well against the shiny laurel-like foliage. While the last flower buds are bursting into bloom in mid-September, the fruit of the June blossoms is ripening to form clusters of brilliant scarlet berries. By October, if the birds can resist the delicacy, the tree will be aflame. After these trees are once established, they seem to do well with ordinary garden care, although it is recommended that they be watered through droughts as they are naturally moisture-loving individuals.

The commonest of the Magnolias, *M. soulangeana,* is available in many varieties with large saucer-like flowers in a color range from white through pink, red and purple. These are all very showy because they blossom early in the spring before the leaves appear. At best

Russian Olive (*Elaeagnus angustifolia*)

they are naturally inclined to branch out and spread, making good specimens of 20 feet in height.

Magnolia stellata, the Star Magnolia, is a small species of not over 12 feet in height with bushy habit. It blooms very early with star-like white flowers about 3 inches across, and is one of the hardiest of all Magnolias.

Malus species. Flowering Crab Apples. Elsewhere in this issue the group is discussed at length. Any of the smaller growing varieties, and there are many to choose from, could be recommended for the limited area. Arnold, Japanese, Tea, and Sargent Crab Apples, because of their smaller size, would be a few on the list worthy of consideration. They are unsurpassed for their blossoms, fruit and form.

Oxydendrum arboreum. The Sorrel Tree might well be found on a list of trees with fall interest because of its superb, brilliant autumn coloring. It has been included in this list of good flowering trees because its panicles of small white flowers which appear in July are quite striking when the tree is placed in the proper setting. The Sorrel Tree grows best in acid soil and could be incorporated in a border with Rhododendron, Laurel, Andromeda and similar plants. If the flowers are seen against such a glossy leaved background, they are unusually dainty. It grows to a height of 15–20 feet with a fairly narrow crown.

Prunus species. Flowering Cherries are discussed at length in another article in this issue of PLANTS & GARDENS. Highly recommended for the small garden, this group provides a wide choice as to size, flowering habit and form. In the choice of a variety, extreme care should be taken to consider the tree in its mature state. *P. sieboldi* and "Amanogawa" are two worth investigating.

Stewartia ovata. The Mountain Stewartia, if properly trimmed in its youth, may be trained to a single stemmed attractive little tree of about 10 feet in height. If ample space cannot be found in a shrub border, it would serve well as a specimen provided it is placed in a protected spot. A native of the South, it has surprisingly proved quite hardy in

Gottscho-Schleisner

Golden-Chain Tree (*Laburnum anagyroides*)

our northern zone. It lends a somewhat southern atmosphere during its blossoming season with its beautiful white camellia-like flowers. Floral interest commences in early summer and continues throughout August. Added to its long blooming period is its habit of turning brilliant scarlet in autumn, making it an outstanding small addition to any garden.

Syringa amurensis japonica. If one cares for bold effects, the Japanese Tree Lilac might fill the need for a specimen tree. It never fails to cause wonder and comment from its observers when in full bloom in June and July. The massive foot-long pyramids of tiny white flowers resemble the Privet in odor as well as appearance. It attains a height of 20–30 feet.

FLOWERING TREES IN THEIR SEQUENCE OF BLOOM

Donald Wyman

Special emphasis on the Northeast

WE COULD not live without the forests of the land, and certainly our homes and gardens and cities would be drab indeed without the shade and beauty of trees. There are many excellent shade trees with a mass of dense foliage during the hot summer months when they are needed most. We will always need them, and plant them everywhere for serviceability and beauty of outline as well.

It is the trees with conspicuous flowers with which we are concerned in this issue of PLANTS & GARDENS, trees that may give excellent shade but at the same time are graced with beautiful flowers at some time of year. Some, like the double flowered Oriental Cherries, may be followed by few if any fruits, while others, like the Oriental Crab Apples, may be covered with brilliantly colored fruits in the fall making them of particular interest for at least two seasons in the year. Still others like the native Dogwood (*Cornus florida*) and Southern Sourwood (*Oxydendrum arboreum*) may have splendid flowers and fruits, and be followed by brilliant coloration of the foliage in the autumn.

Therefore, there are many reasons why we should give our attention to the ornamental flowering trees. Many interesting phases of these have been described in the following articles, but first it might be well to mention about sixty of them in the order in which they bloom, so that gardeners who want a display of flowers at some particular time can glance through this list and thus be aided in selecting just the right tree for the right place.

The sequence in which plants bloom is about the same the country over regardless of where the plants are growing. The actual time they bloom does vary considerably. The season may be "early" or "late" depending on annual temperature variations. Differences in latitude make differences of months, and differences in altitude and exposure make differences of days or even weeks. Most gardeners have recognized these facts. A trip through Florida will show the Flowering Dogwood in bloom months sooner than it is in Massachusetts. Lilacs and fruit blossoms can always be appreciated in Virginia several weeks before they can in Maine, unless due to the idiosyncrasies of the weather, a cold spring has occurred in Virginia and a warm spring in New York. On very rare occasions lilacs and fruit blossoms may bloom in both places together.

To show how much this annual variation might be, it is interesting to see when the Yoshino Cherry (*Prunus yedoensis*) has bloomed about the *Tidal Basin* in Washington, D. C., over the past years. These data have been supplied by Paul Russell of the Bureau of Plant Industry, U. S. D. A.

1930—April 1	1937—April 14	1944—April 9
1931—April 11	1938—March 23	1945—March 20
1932—April 15	1939—March 29	1946—March 22
1933—April 8	1940—April 13	1947—April 13
1934—April 15	1941—April 12	1948—March 27
1935—March 31	1942—April 6	1949—March 29
1936—April 3	1943—April 2	

Then to show how blooming times vary with latitude, it might be of interest to see when the Flowering Dogwood has been noted in full bloom about the country.

Mid-February—Glen St. Mary, Florida
Late March——Augusta, Georgia
Early April——St. Louis, Missouri
Mid-April ——Asheville, N. C.
Late April ——Washington, D. C.
Early May ——Columbus, Ohio
Early May ——Philadelphia, Penna.
Early May ——London, England
Mid-May ——Chicago, Ill.
Mid-May ——Detroit, Michigan
Mid-May ——Boston, Mass.
Mid-May ——Seattle, Wash.
Late May ——Portland, Maine

FLOWERING TREES

Order of Bloom	*Height of Tree*	*Color of Flower*
March		
Silver Maple (*Acer saccharinum*)	120′	red
Willows (*Salix* species)	30–100′	catkins
Early April		
Red Maple (*Acer rubrum*)	120′	red
Cornelian Cherry (*Cornus mas*)	20′	yellow
Poplars (*Populus* species)	50–75′	catkins
Mid-April		
Birches (*Betula* species)	30–50′	catkins
Late April		
Norway Maple (*Acer platanoides*)	100′	yellow
Yulan Magnolia (*Magnolia denudata*)	50′	white
Kobus Magnolia (*Magnolia kobus*)	30′	white
Star Magnolia (*Magnolia stellata*)	15′	white
Mandshurian Crab Apple (*Malus baccata mandshurica*)	42′	white
Apricot (*Prunus armeniaca*)	30′	pink
Sargent Cherry (*Prunus sargenti*)	75′	deep pink
Higan Cherry and vars. (*Prunus subhirtella*)	25′	white and pink
Yoshino Cherry (*Prunus yedoensis*)	25′	pink
Early May		
Sugar Maple (*Acer saccharum*)	120′	greenish yellow
Shadblow (*Amelanchier* sp.)	30′	white
Anise Magnolia (*Magnolia salicifolia*)	30′	white
Saucer Magnolia (*Magnolia soulangeana*)	20′	white, red, purplish
Midget Crab Apple (*Malus micromalus*)	25′	pink
Mazzard Cherry (*Prunus avium*)	72′	white
Peach (*Prunus persica*)	25′	pink
Oriental Cherries (*Prunus serrulata*)	25′	white to red
Mid-May		
Red Horse Chestnut (*Aesculus carnea*)	40′	red
Horse Chestnut (*Aesculus hippocastanum*)	100′	white to pink
Red-bud (*Cercis canadensis*)	40′	deep pink
Flowering Dogwood (*Cornus florida*)	40′	white to red
Silverbell (*Halesia monticola*)	100′	white
Fraser Magnolia (*Magnolia fraseri*)	50′	white
Arnold Crab Apple (*Malus arnoldiana*)	25′	pink and white
Carmine Crab Apple (*Malus atrosanguinea*)	25′	carmine
Siberian Crab Apple (*Malus baccata*)	50′	white
Japanese Flowering Crab Apple (*Malus floribunda*)	25′	pink and white
Parkman Crab Apple (*Malus halliana parkmani*)	20′	deep pink
Tea Crab Apple (*Malus hupehensis*)	25′	white and pink

With the sequence being the same throughout the country, but with the actual dates varying with annual temperature fluctuations, latitude and altitude, it is only necessary to have some list of sequence of bloom with the approximate dates for one area. Then, by noting local blooming dates for a few things appearing in the list, the entire sequence can be easily oriented, and this can be done for any area throughout the country. The following sequence of bloom has been noted for these sixty plants as they bloom in the vicinity of Boston, Massachusetts.

FLOWERING TREES

Order of Bloom	*Height of Tree*	*Color of Flower*
Common Apple (*Malus pumila* vars.)	50′	white and pink
Purple Crab Apple (*Malus purpurea*)	30′	purplish red
Chinese Flowering Crab Apple (*Malus spectabilis*)	50′	rose
Chokecherry (*Prunus virginiana*)	30′	white
Late May		
English Hawthorn (*Crataegus oxyacantha*)	15′	white
Dotted Hawthorn (*Crataegus punctata*)	30′	white
Umbrella Magnolia (*Magnolia tripetala*)	40′	creamy white
Sweet Bay Magnolia (*Magnolia virginiana*)	60′	white
Wild Sweet Crab Apple (*Malus coronaria* vars.)	30′	pink
Bechtel Crab Apple (*Malus ioensis plena*)	50′	deep pink
Sargent Crab Apple (*Malus sargenti*)	8′	white
Rivers Crab Apple (*Malus spectabilis riversi*)	50′	pink
Cutleaf Crab Apple (*Malus toringoides*)	25′	white
Black Cherry (*Prunus serotina*)	90′	white
Early June		
Yellow-wood (*Cladrastis lutea*)	50′	white
Japanese Dogwood (*Cornus kousa*)	20′	white
Washington Hawthorn (*Crataegus phaenopyrum*)	30′	white
Cockspur Thorn (*Crataegus crusgalli*)	25′	white
Paul's Scarlet Thorn (*Crataegus oxyacantha pauli*)	15′	red
Locust (*Robinia pseudoacacia*)	80′	white
Mountain Ash (*Sorbus aucuparia*)	50′	white
Japanese Snowbell (*Styrax japonica*)	30′	white
Mid-June		
Northern Catalpa (*Catalpa speciosa*)	100′	white
Tulip Poplar (*Liriodendron tulipifera*)	150′	yellow and red
Tree Lilac (*Syringa amurensis*)	12′	creamy white
Late June		
Korean Stewartia (*Stewartia koreana*)	50′	white
Early July		
Amur Maackia (*Maackia amurensis*)	40′	creamy white
Mid-July		
Golden Rain Tree (*Koelreuteria paniculata*)	30′	yellow
Late July		
Hardy Silk Tree (*Albizzia julibrissin rosea*)	20′	red and white
Sourwood (*Oxydendrum arboreum*)	60′	white
Late August		
Franklinia (*Franklinia alatamaha*)	20′	white

FAMILIES OF FLOWERING TREES

Carlton B. Lees

The fact that a plant is a tree or shrub, vine, or herbaceous annual or perennial does not determine its family relationship; it is flower structure that counts. The sweet-pea type of flower is found in the Locust tree, Broom (a shrub), Wisteria vine, garden peas and beans, and the Lupine of the perennial border. The flowers of these plants are strikingly alike and therefore are grouped with other plants having similar characteristics into the Pea family. So it is with other plants—blossom structure is the most important single quality in a plant that determines its classification into a family group.

The flowering trees in this issue of PLANTS & GARDENS are classified into the following families:

PEA FAMILY
(*Leguminosae*)
Acacia
Silk tree
Orchid tree
Cassia
Red Bud
Royal Poinciana
Golden-chain
Locust
Chinese Scholar-tree
Maackia
(*other relatives are Peas, Beans, Clover*)

BIGNONIA FAMILY
(*Bignoniaceae*)
Catalpa
Spathodea
Tabebuia
(*other relatives are Trumpet-creeper, Jacaranda*)

HEATH FAMILY
(*Ericaceae*)
Sour-Wood
(*other relatives are Rhododendron, Blueberry, Heather*)

SOAPBERRY FAMILY
(*Sapindaceae*)
Golden-rain tree

OLEASTER FAMILY
(*Elaeagnaceae*)
Russian Olive

HORSECHESTNUT FAMILY
(*Hippocastanaceae*)
Horsechestnut

ROSE FAMILY
(*Rosaceae*)
Shadbush
Hawthorn
Flowering Crab
Flowering Cherry
Mountain Ash
(*other relatives are Peach, Pear, Strawberry, Garden Roses*)

MAGNOLIA FAMILY
(*Magnoliaceae*)
Magnolia
Tuliptree

NYSSA FAMILY
(*Nyssaceae*)
Dove tree
(*another relative is Sour Gum*)

DOGWOOD FAMILY
(*Cornaceae*)
Dogwood

LOOSESTRIFE FAMILY
(*Lythraceae*)
Crape-Myrtle
(*other relatives are Purple Loosestrife, Water Purslane*)

COMBRETUM FAMILY
(*Combretaceae*)
Terminalia

BOMBAX FAMILY
(*Bombacaceae*)
Ceiba

TEA FAMILY
(*Theaceae*)
Franklin tree
Stewartia
(*other relatives are Camellia, Commercial Tea*)

OLIVE FAMILY
(*Oleaceae*)
Fringetree
Lilac
(*other relatives are Privet, Forsythia, Winter Jasmine*)

FIGWORT FAMILY
(*Scrophulariaceae*)
Paulownia
(*other relatives are Foxglove, Veronica, Snapdragon*)

DOGBANE FAMILY
(*Apocynaceae*)
Frangipani
(*other relatives are Myrtle, Indian Hemp*)

RUE FAMILY
(*Rutaceae*)
Evodia

CALTROP FAMILY
(*Zygophyllaceae*)
Guaiacum

STORAX FAMILY
(*Styracaceae*)
Silver-Bell
Styrax
Epaulette tree

Close-up of the double flowers of Kwanzan Cherry.

The bright flowers of Scarlet Eucalyptus *(Eucalyptus ficifolia)* make it an ornamental shade tree for semi-tropical regions.

Flowers of the fast growing Tulip Tree *(Liriodendron tulipifera)* have a beauty all their own. Fossils of the tree have been found around the world, but living stands are now found only in the eastern United States and southeastern China.

Crape-myrtle (*Lagerstroemia indica*), 3-year-old specimen; widely grown in the south.

Dolgo Crab, one of many forms of Siberian Crab Apple

The double-flowered Cherries in Brooklyn Botanic Garden's Cherry Lane are the variety Kwanzan (*Prunus serrulata sekiyama*) ; the trees are now 30 years old. Blossom time has great charm when patches of sunlight are reflected from the petal-strewn ground.

The single-flowered Cherries bordering the Tidal Basin at Washington, D. C., are the variety Yoshino (*Prunus yedoensis*)

Weeping Cherry (*Prunus subhirtella pendula*) may be used for its mass color effect or as a lone specimen to bring out its graceful branching habit.

A branch of Silver Bell (*Halesia carolina*), an ornamental tree of great charm.

The Kwanzan (or Kanzan) Cherry; a 7-year-old specimen.

Saucer Magnolia *(Magnolia soulangeana)* is a hybrid between *M. liliflora* and *M. denudata,* and most popular of the large-flowered hardy magnolias.

Left: The abundant flowers of Carmine Crab Apple *(Malus atrosanguinea)* make it a top choice among ornamental trees. *Right:* This semi-double flowered Plum is *Prunus blireiana,* a hybrid between two varieties of *P. cerasifera.*

Left: Branch of Flowering Peach *(Prunus persica albo-plena)*; *right, (P. persica rubro-plena).*

The Silk-Tree, or "Hardy Mimosa" *(Albizzia julibrissin rosea)* flowers within 6 to 7 years from seed.

(Color photo courtesy Rutherford Platt, and taken by him at Frank Bailey's "Munnysunk" on Long Island.)

Harold H. Costain

THE FLOWERING CHERRIES OF JAPAN

Many kinds—long season of bloom

George M. Reed

THE STORY of flowering cherry trees in Japan begins more than a thousand years ago. Wild cherry trees grew in mountains and forests and the Japanese people were very successful in transplanting them and selecting varieties for their gardens and parks. The Mountain cherries (Yama-Zakura) were the most common and widely distributed. In ancient times, these single-flower trees

were transplanted to Temple and Court grounds in the region about Kyoto.

The cherry groves of Yoshino are famous for their beauty. The groves extend for nearly four miles and contain many thousand cherry trees of the white mountain group. Along the banks of the Katsura River, which flows through the western section of Kyoto, many cherry trees were planted in ancient times. The cherry avenue at Koganei, a western suburb of Tokyo, is well known. The trees were planted 1736–1740 on both sides of a small stream and extend for a distance of about four miles. There are many fragrant trees scattered among the others.

It was not until late in the 18th Century that a few double flower varieties were known, but after Tokyo became the capital in 1868, the gardeners and horticulturists discovered many more.

The first information about the flowering cherries of Japan among foreigners was recorded by Kaempfer (1712), Thunberg (1784), and Siebold (1830). A cherry with double white flowers from Canton, China, was introduced into England in 1822 by Samuel Brooks. In 1832 they were listed in France and in 1852 by Parsons & Company in the United States. In 1903, a collection of thirty named varieties was received from Japan through David Fairchild and Barbour Lathrop, and in 1904 fifty named varieties were imported from the Yokohama Nursery Company. In 1906, David Fairchild introduced twenty-five varieties of both single and double flower types, planting them at North Chevy Chase, Maryland.

The well-known and popular collection in Potomac Park, Washington, D. C., was introduced in 1912, more than two thousand trees being presented by the City of Tokyo, Japan. Most of the trees are the single flower variety Yoshino which blooms in late March or early April. Ten additional varieties were received and these extend the blooming season.

Other fine collections are found at the Arnold Arboretum, Jamaica Plain, Mass., Durand-Eastman Park, Rochester, N. Y., and Volunteer Park, Seattle, Wash.

In 1921, Cherry Walk at the Brooklyn Botanic Garden was planted with thirty trees of the excellent variety "Kwanzan." Several other varieties were planted about the same time. In 1941, a large planting of seventy-six trees, in four rows, of "Kwanzan" was made on the Esplanade and many additional kinds were added to the Garden collection. Annually the Garden trees attract many thousands of visitors who come to enjoy their beauty in March and April.

Dr. Manabu Miyoshi, formerly Director of the Tokyo Botanic Garden, has studied the cherries of Japan very extensively. He has listed many species and varieties and some of his publications contain very fine color plates.

For our purpose, the varieties may be grouped in six species, as follows:

I. Prunus serrulata

Many of the best and well-known varities are found in this species, more than one hundred being listed in Japan. About fifty varieties, some difficult to distinguish, are recorded in the United States. They are placed in three groups on the basis of the habit of growth of the trees.

1. *Trees with spreading branches.*

The flowers may be single, semi-double, or double and the color white, pink, or greenish yellow.

There are several fine varieties in the group with single white flowers. "Ojochin" (Large Lantern) becomes a wide-spreading tree about 20 ft. tall. The flower buds are pink and the open flowers are white or nearly so, about two inches across, in pendulous clusters of three to five with long peduncles. "Shirayuki" (Snow White), a tree about 20 ft. high, has pink buds and pure white flowers, about 1½ in. across, in short-stalked stiff clusters of two to four. "Taki-nioi" (Fragrant Cascade) becomes a small,

much branched tree. The buds are slightly pinkish and the white flowers, about 1 in. across, occur in stiff clusters of three to six and are delicately fragrant. "Shirotae" (Snow White), a fine variety with double white flowers, becomes a large tree. The buds are pale pink and the flowers, about 2 in. across, in clusters of two to five.

Many of the best varieties are found in the pink flowered group. "Koshioyama" (Koshio Mountain) is a tree with single pink flowers. Another fine variety with single pink flowers is "Mikuruma-gaeshi" (The Royal Carriage Returns). It is a medium size tree, about 18 ft. high, with pale pink flowers, about 2 in. across, in stiff clusters of three or four. The name is derived from an ancient tradition that the Emperor was greatly pleased on his visit to the cherry trees and, after passing, a discussion with his retainers arose whether the flowers were single or double. To settle the question, the Emperor ordered the carriage to return for another view.

In the group with pink double flowers, one of the best is "Kwanzan," named for a Japanese mountain. The flower buds are rose-red, the open petals clear pink, the flowers more than 2 in. across, in clusters of three to five. Along Cherry Walk at the Brooklyn Botanic Garden there are thirty trees in two rows of this variety. "Kwanzan" is also planted in the Esplanade. It becomes a large tree with wide-spreading branches. "Fugenzo" (Goddess on a White Elephant), also known as "James H. Veitch," is similar to "Kwanzan" but not so attractive. "Gijo-Zakura" (Dancing-girl Cherry) is a small tree with pale pink flowers, a little over one inch across, in stiff clusters of three or four. "Shogetsu" (Moon Hanging Low by a Pine Tree) is a small tree with pale pink flowers, about two inches across, in pendulous clusters of three to six flowers.

"Ukon" (Greenish Yellow) is an interesting variety with semi-double, pale greenish-yellow flowers, about 1½ in. across, in pendulous clusters of three to five. The buds are light pink and pink stripes may occur on the open petals. The tree grows to about 20 ft.

2. *Trees of fastigiate habit.*

"Ama no gawa" (River of Heaven or Milky Way) is the best known variety. It grows to a height of about 25 ft. The flower buds are deep pink and the flowers light pink, about 1½ in. across, in stiff erect clusters of two to four. The tree shows well when viewed against a background of evergreens.

3. *Trees with pendulous branches.*

"Kiku-shidare" (Weeping Chrysanthemum) is a good example of this type. It is also listed as "Cheal's Weeping." It becomes a tall tree with stiff arching branches. The flower buds are deep pink and the flowers double with fifty or more petals, pink, about one inch across, borne in short stalked clusters.

II. Prunus subhirtella (Higan Cherry)

The varieties of this species are the Higan or Equinox cherries, and are among the earliest to flower.

Beni-higan (Pink Higan or Pink Equinox).

It becomes a large tree, 60 ft. or more high, and grows wild in portions of Japan. The flowers are single, small and pale pink.

"Jugatsu-Zakura" (October Bloomer).

This variety bears flowers both spring and autumn. The tree is more or less bushy, about 20 ft. high. The flower buds are pinkish. The flowers are single or double, pale pink or almost white, about 1/2 in. across. Seeds are sometimes produced.

Shidare-higan (Pendulous Higan).

This variety becomes a large tree 50 ft. or more high. The flowers are single, varying from white to deep pink. It is very common in Japan.

III. Prunus yedoensis (Yoshino Cherry)

This species becomes a wide-spreading tree with pink flower buds and single flowers, pale pink or nearly white, borne in clusters of two to five. It blooms very early. The eight hundred or more trees around the Tidal Basin in Potomac Park, Washington, D. C., bloom in late March or early April, drawing great crowds of visitors.

Shidare-Yoshino differs from Yoshino in its pendulous habit of growth. The well-known Gion-no-Zakura at Kyoto, Japan is probably a weeping form of Yoshino.

IV. Prunus campanulata (Taiwan Cherry)

A small tree, 20 ft. high, with rose or deep red flowers, about 3/4 in. across.

V. Prunus sargenti (Yama-Zakura, Mountain Cherry, or Sargent Cherry)

This is one of the finest cherry trees, attaining a height of 60 ft. The flowers are single, pink and very abundant, 1 to 1½ in. across. The leaves in early spring are brownish red and in the autumn turn to scarlet and crimson shades.

VI. Prunus sieboldi (Takasago Cherry)

A spreading tree about 20 ft. high. The flowers are fragrant, semi-double, light pink or almost white. The leaves are densely pubescent.

Propagation

Seeds are produced abundantly by the cherry species. The Sargent, Taiwan and Yoshino species come true from seed unless cross pollination has occurred. Variations are common among seedlings of *Prunus subhirtella.*

The single flower varieties usually produce seed and many of the semi-double varieties may do so. From the seedlings new varieties may be obtained.

Cherries are also propagated by budding or grafting. In Japan, seedlings of Yama-Zakura, *Prunus serrulata*, are commonly used as understock. Seedlings of the mazzard cherry are generally employed in the United States.

Diseases and Insect Pests

The flowering cherries are relatively free from serious fungous diseases. Some insect pests, as the San Jose scale, white peach scale, and oriental fruit moth, occur frequently. The methods of control used for orchard cherries are effective.

Culture and Hardiness

The flowering cherries grow satisfactorily under the same conditions as sweet cherries and peaches. Planting is best done in the spring and a fertile soil is needed. They do not require much pruning beyond the cutting out of broken and dead branches.

Flowering Period

The time of bloom is dependent on the weather. They may be expected to flower soon after the first of March and continue to late April or even early May. There is a wide range in the period of bloom among the species and varieties. The very early bloomers are some of the single-flower types and the latest to flower, the fine double-flower varieties.

Rarely ever is there a failure to flower. Year after year the trees may be counted on for a fine display. A single tree on the lawn, a row of trees bordering a walk, or a clump in an appropriate setting enhances the pleasures of spring.

THE BEST OF THE CRAB APPLES

. . . for character and fragrance

Donald Wyman

THE ORIENTAL crab apples constitute a grand group of flowering trees, gorgeous with their fragrant flowers in the spring, and again colorful in the fall with their bright fruits. Over 250 of them are being grown in this country, not all of them are available from commercial sources, but the catalogues contain many—too many. Even though they grow to different heights, have different habits and variously colored flowers and fruits, nevertheless, the best performers have proved themselves over a wide area in this country, time and again, and it is these that should be grown. The ones that are recommended here are all available commercially (or soon will be) and are at the top of the list for any gardening amateur who is interested in having some flowering trees.

It should be said at the outset, especially for those who have had difficulty growing the old fashioned Bechtel Crab, that the natives of the Orient are not susceptible to the disfiguring Juniper rust. This rust mars the foliage of varieties native to America with brown spots on the leaves when they are grown in the vicinity of our native junipers. For-

H. Howard photo

The Tea Crab, *Malus hupehensis*

H. Howard photo

Flowering branches of the crab apple hybrid "Katherine"

tunately the exotics are free from this trouble and so can be grown without fear of later disappointments.

As a result of the vigor and hardiness of these trees, they can be grown over a very wide area of the United States and Canada, in fact wherever apples prove hardy. In some large collections, notably the ones at the Arnold Arboretum and on ground owned by the Des Moines Water Works in Iowa, there are over 200 varieties on display. This wide selection should not deter one, however, because even chance seedlings which may appear anywhere in the vicinity of fruiting trees may grow into choice specimens.

The crab apples, as a group, are valued for several reasons, each one of which may be important under some conditions, but all of which combine to make this group of plants one of our most highly valued groups of flowering trees. In the first place they are valued for their flowers, somewhat smaller than those of the common apples but borne in great profusion. The majority of the species have single flowers, but there are some semi-double and double flowered varieties comparing favorably with varieties of the oriental flowering cherries. The colors range from white through pink and red to dark purplish red, with many variations. Some of the most exquisite color combinations are to be found when they are in bud, some of them being far more colorful and beautiful in bud than when in full bloom! Then too, most of the varieties have very fragrant flowers, especially true of *Malus baccata,* the Siberian Crab.

The fruits of the crab apples are their second valued ornamental asset. These vary in size from that of a small pea to fruits nearly two inches in diameter, most of them being less than an inch. The fruits of some are deep red, those of others bright yellow and still others a combination of these two colors. It is of interest to note that the fruits of most of our native crab apples are green—and hence are not ornamental at all.

The habits of these trees vary considerably, thus affording a splendid group from which to select plants for various needs about the home grounds. Most are small trees, about twenty feet tall. Some, however, are standard trees growing fifty feet or more in height (*M. baccata,* the Siberian Crab is one example) and others like the Sargent Crab (*M. sargenti*) are only six to eight feet in height. Some have pendulous branches (the variety "Oekonomierat Echtermeyer"), others are rigidly upright while young. However, fastigiate crab apples do not keep this habit through their entire life, for, as heavier and heavier crops of fruits are borne, the branches are weighted down more and more, and finally they are pulled down so far by the weight of the fruit crop that they do not recover their upright habit. Some varieties like the Japanese Crab (*M. floribunda*) are defi-

nitely mound-like in habit, and though they may grow to be fifteen feet tall, they never lose that mound-like habit, provided their branches touch the ground on all sides.

Foliage color throughout the growing season is another reason some varieties are valued. Certain forms like "Arrow," "Hopa," "Makamik," *purpurea* varieties, "Redflesh," "Red Silver" and "Ockonomierat Echtermeyer" have reddish to bronze colored leaves that keep this color when most other foliage is green—a decided asset if one is interested in varying slightly, the green of a planting under continual observation. In addition the foliage of a very few varieties turns red or yellow in the fall, not as brilliant as that of oaks and birches, but enough to give them considerable fall interest. Such would be "Geneva," *halliana spontanea, dawsoniana*, "Prince Georges," *ioensis plena* and "Red Tip."

Finally, crab apples are valued for the interest their fruits have for birds and humans alike. Some, like the variety "Bob White," will hold their fruits all winter long, or sufficiently late in the winter so they will afford an excellent food source for the birds when most other foods are gone or are covered by snow. Some of the larger fruited crab apples are of course valued economically for jelly making. All in all these plants have much to recommend them, and it might be interesting to see how they have become available for American gardens.

Apples have been grown in European countries since before the time of Christ. It is most likely that the better fruiting seedlings of the two European apples (*M. pumila* and *sylvestris*) were selected and grown as apples while the poorer fruited plants eventually became known as crab apples. In Captain John Smith's time, it is noted that he wrote of crab apples growing in Virginia (probably *M. coronaria* and *M. angustifolia*). We can assume that the first "foreign" crab apple was introduced to this country slightly before 1784, this being the Siberian Crab which has been so widely distributed.

Early colonial settlers had no reason to grow crab apples at first, for larger cultivated forms of the apple were available. As they prospered, and time became more available for leisure, they used some of the native species for planting about the garden. Then as the small fruiting Siberian Crab became distributed, and the common apple was carried westward by the Indians and white settlers, various forms of smaller apples or crab apples appeared, possibly hybrids between these two groups. This was augmented considerably in the early 19th century when it was found that the apple varieties of Europe were not hardy in many of our western settlements, and that the Siberian Crab was. Much hybridizing was done between the two (and still is) in an attempt to produce hardier apples. Of course the offspring of many of these crosses are trees with beautiful fruits considerably under one inch in diameter, certainly not in the apple class at all, but very beautiful as ornamentals. Some of these early varieties are still being used for jellies today, nearly 100 years later, namely, "Hyslop," "Transcendent" and "Soulard."

Travellers in China and Japan began to send many plants back to America in about 1852. Crab apples were also included and since that time, the records are full of plant hunting and exploration, resulting in the rich collection of crab apples we have from the Orient today. There are three species native of Europe (*M. pumila, sylvestris* and *florentina*), nine species native of North America and seventeen species native of Eastern Europe and Asia. Not all are of prominent ornamental value but most of them are growing in this country now.

Propagation

Most gardeners are not interested in the propagation of woody plants, feeling that this is the realm of the expert, but in order to be assured of obtaining plants true to name, one should understand a

Arnold Arboretum photo

A twelve-year old Arnold Crab apple, *Malus arnoldiana*

little about these crab apples. All but about four (*M. toringoides, hupehensis, sikkimensis, florentina*) hybridize freely one with the other. When seeds are collected from trees that are not growing in pure stands, and this is more often the rule rather than the exception, there is no positive proof that the seedlings will grow into trees like the parent. Some may, but a large percentage of them may have flowers and fruits considerably different from the parent tree from which they were collected. This explains why many have been disappointed in receiving plants that have not been true to name. The nurseryman should propagate most of these plants chiefly by budding or grafting, so that they will reproduce trees identical with the parent. This is not only true of the species, but also of the new hybrids and clons that are appearing in ever increasing numbers. Consequently trees should be bought from reliable nurserymen who have propagated their plants in such a way that they can be guaranteed true to name. The promiscuous propagation of most of these plants by seed frequently results in progeny that does not have the desired characteristics of the parent plant.

Disease and insect pests are not too hard on these small trees, but the story is not complete without recognizing the fact that they are susceptible to the common pests of the apple, namely, fire blight, borer and scale. Scale insects can be easily controlled by dormant spraying with a good miscible oil. Fire blight does not seem to be a serious trouble on the oriental types, at least in the Arnold Arboretum where the crab apples are growing adjacent to pears that are severely troubled with the disease.

The flat-headed apple tree borer can be a serious pest, burrowing into the bases of the trunks of young trees and practically girdling them. Whenever this pest is evident, it should be cut out or destroyed with some chemical in the burrow hole.

H. Howard photo

Flowering branches of the Siberian Crab apple, *Malus baccata*

Some of the Best for Ornamental Flowers

The following twenty crab apples are among the best of the group for flower. Where foliage color, fruits, autumn color and economic uses for the fruits are important considerations, other varieties might be considered as well. Certainly the following groups offer a wide range of colorful flowers and different sizes and might well be considered first by the gardener, before he investigates the possibilities of the many others available to him from commercial sources. All those mentioned are about fifteen to twenty feet tall at maturity unless otherwise noted.

1. Arnold Crab (*M. arnoldiana*)—flowers single, nearly two inches in diameter, pink and white, flower buds red; fruit yellow to red, 5/8 inch in diameter. This is a hybrid (*M. floribunda* × *baccata*) originating in the Arnold Arboretum in 1883, but it has been at the top of most lists of good flowering crab apples ever since. Very definitely mound-like in habit.

2. Carmine Crab (*M. atrosanguinea*)—flowers single, one inch in diameter, carmine buds and flowers gradually fading to a dull pink; fruit red and less than 1/2 inch in diameter. Another hybrid (*M. halliana* × *sieboldi*) but dense and mound-like in habit with very dark green foliage throughout the growing season.

3. Siberian Crab (*M. baccata*)—flowers single, white, 1–1½ inches in diameter, very fragrant; fruit red or yellow, 3/8 inch in diameter. There are many varieties of this hardy crab apple, mostly growing up to 50 feet in height. A native of northeastern Asia and northern China.

4. Charlotte Crab (*M. coronaria charlottae*)—flowers double, pink, 2 inches in diameter; fruit 1½ inches in diameter and yellow-green. Discovered in 1902 in Waukegan, Illinois, growing wild.

5. "Dorothea" (*M. halliana parkmani* × *arnoldiana*)—flowers double, 2 inches in diameter, pale crimson; fruit yellow, 1/2 inch in diameter. An excellent new variety discovered in the Arnold Arboretum in 1943. Excellent because it combines double flowers with brilliantly colored yellow fruit.

6. "Erie" (a hybrid of *M. pumila niedzwetzkyana*)—flowers single, purplish red, 1½ inches in diameter; fruit red, 1 inch in diameter.

7. "Flame" of undetermined origin, first found at the University of Minnesota Experimental Station about 1920. Flowers single, white, 1½ inches in diameter, buds pink; fruit bright red, 3/4 inch in diameter. This is very hardy and can be grown anywhere, even in Minnesota.

8. Japanese Flowering Crab (*M. floribunda*)—flowers single, pink and white, one inch in diameter; fruit 3/8 inch in diameter, yellow and red. Dense and mound-like in habit, a very popular type.

9. Parkman Crab (*M. halliana parkmani*)—flowers double, deep pink, 1¼ inches in diameter; fruit red, 1/2 inch in diameter. Least hardy of all the oriental crab apples, but also one of the most beautiful in flower.

10. Tea Crab (*M. hupehensis*)—flowers single, white, 1½ inches in diameter, buds pink to red; fruits red and 3/8 inch in diameter. Of value chiefly for its picturesque vase-shaped habit of branching.

11. Bechtel Crab (*M. ioensis plena*)—flowers double, deep pink, 2 inches in diameter; few fruits; one of the sports of the native Prairie Crab and hence susceptible to disfiguring attacks of the Juniper rust fungus. There is a new disease apparently causing the death of this tree over a wide-spread area of the northeast, and in areas where this is prevalent, it had best not be grown.

12. "Katherine" (*M. halliana parkmani* × *baccata*)—flowers double, pale pink fading white, 2¼ inches in diameter; fruits 3/8 inch in diameter, reddish. Another variety with double flowers followed by ornamental fruits.

13. "Makamik" (*M. pumila niedzwetzkyana* hybrid)—flowers single, purplish red, 2 inches in diameter; fruits red, 1¾ inches in diameter.

14. "Oekonomierat Echtermeyer"—flowers single, purplish red, 1½ inches in diameter; fruits purple, 1 inch in diameter. Mentioned here because this hybrid is one of the few crab apples with truly weeping habit. When grafted high on standard understock, its pendulous branches make a beautiful display.

15. "Prince Georges" (*M. ioensis plena* × *angustifolia*)—similar in flower and habit to the Bechtel Crab, but apparently not susceptible (at least up to now) to the same diseases.

16. Purple Crab (*M. purpurea*)—flowers single, purplish red, 1½ inches in diameter; fruits purplish, 3/4–1 inch in diameter. Foliage reddish to bronze. There are several popular varieties—*aldenhamensis* being semi-double, *eleyi*, and *lemoinei* which has the darkest colored flowers of all the crab apples.

17. "Red Silver" (*M. baccata* × *pumila niedzwetzkyana*)—flowers single and purplish red; fruit purplish, 1¾ inches in diameter.

18. Sargent Crab (*M. sargenti*)—flowers single, white, 1 inch in diameter; fruits red, 3/8 inch in diameter. Valued because it is the smallest of all the crab apples, growing about 6–8 feet tall.

19. "Sissipuk" (*M. baccata* × *pumila niedzwetzkyana*)—flowers single, purplish red, over 1 inch in diameter; fruit red, 1¼ inches in diameter. The foliage is a reddish bronze during part of the growing season.

20. Rivers Crab (*M. spectabilis riversi*)—flowers double, pink, 1¾ inches in diameter; fruits green. This is an old-fashioned favorite, having been grown in this country for over sixty years.

TREES FOR FLOWERS IN THE INLAND EMPIRE

From the Cascades to the Rockies

Harold T. Abbott

THE TERM "flowering trees" is one which on many occasions has led to discussion and the need for clarification. In the minds of most amateur gardeners, flowering trees call forth recollections of flowering crab apples, tree lilacs, hawthorns, and other similar trees of medium height. To a few more serious observers of trees planted for their flowers, the term flowering trees will suggest such well-known examples as the Tulip tree (*Liriodendron tulipifera*) growing to more than 100 feet, the Horsechestnut (*Aesculus hippocastanum*) with its showy erect panicles, and the Yellowwood (*Cladrastis lutea*) with its equally distinctive drooping panicles. To list certain other flowering trees would suggest to residents of various northern latitudes not trees at all but shrubs, because of the effects of environment in the development of a tree-like or a shrubby habit as the case may be.

In the Pacific Northwest there is a large area east of the Cascade Mountains extending to the Rockies in which many of the well-known flowering trees have been successful in adapting themselves to the alkaline soil, in withstanding the severe desert drought, and in accepting the differences in temperature. The availability of unlimited water supplies to most of the towns and cities of this region has made it possible to introduce many species of trees to add color of flower and fruit to municipal parks, parkways, and private grounds.

Compared with the eastern, midwestern, and Pacific coast areas, the number of species now in common use is rather limited, but each year the list of hardy flowering trees grows longer. The peculiar conditions of climate with comparative freedom from fungus diseases and many insects prevalent in other parts of the country, have aided in the growing of ornamental deciduous trees.

Foremost among the trees for garden use have been the flowering crab apples. They have proven perfectly hardy and because of their additional glory of au-

McFarland photo

Flowers and foliage of Yellow-Wood (*Cladrastis lutea*)

Richard Averill Smith

European Mountain-Ash (*Sorbus aucuparia*)

tumn fruits, they have become very popular. A number of them have been used for many years and are well recommended, such as Eley Crab (*Malus purpurea eleyi*), Redvein Crab (*M. pumila niedzwetzkyana*), Scheidecker Crab (*M. floribunda scheideckeri*), Hall Crab (*M. halliana*), Bechtel Crab (*M. ioensis plena*), and "Hopa" Crab (*M. adstringens* × *M. pumila niedzwetzkyana*). Along with the cherries and plums, the crabs were used only moderately prior to 1935. During the fall of that year a severe drop in temperature brought death to hundreds of cherries and plums in this area. The crab apples showed little or no injury as a result of the icy blast.

The slightly alkaline conditions of the soil and of the water used for irrigation seem to favor the growth of one of the most prominent trees, the European Mountain Ash (*Sorbus aucuparia*). As a street tree, a lawn specimen, or as a tree in mass planting, it does well. The blossoms are carefully observed in anticipation of the still greater show of autumn fruits which attract thousands of robins and waxwings during the late winter season.

In the early spring the Redbud (*Cercis canadensis*) blooms successfully. A protection against the drying winds from the south is required for Redbud but with moderate care it will develop into a well-formed tree to 20 feet. Slightly earlier to come into bloom, but with a similar type of flower mass is the Cornelian Cherry (*Cornus mas*). This small tree was planted many years ago in the Spokane parks, and has become a great favorite with the public. Because of its particularly early flowering habit it is often mistaken at a distance for one of the forsythias. The brilliant red cherries in the fall and the rich green foliage throughout the summer add to its qualifications.

Native to this region are the Western Service-berries (*Amelanchier florida* and *A. cusicki*), shrubs or small trees which often develop into excellently formed erect trees of distinct character. The more common variety is *florida*, and while it is at home in the dry rocky pockets of the basaltic cliffs of eastern Washington, it will respond well to cultivation. *A. cusicki* has the largest blossoms and the most spectacular fruits. As compared with the eastern Shadblow, these western relatives lack the grayish bark and feathery character of the flowers, but the reddish branches, the dense foliage and heavy masses of snow white flowers give them a high rating among the showiest of spring displays.

The Flowering Dogwood (*Cornus florida*) lives up to its reputation wherever it is planted, and the Pacific Northwest is no exception. It is particularly welcome in eastern Washington where the Pacific Dogwood (*Cornus nuttalli*) has not yet proven to be hardy. The eastern dogwood has been growing in Spokane for over 40 years. It puts on little

growth each year because of the lack of moisture and for this reason has not been planted widely in private home grounds. There are large specimens in some of the older parks. The Pacific Dogwood has been found at high altitudes in the region of Lake Chelan, east of the Cascades, and from these trees small ones have been grown successfully in Spokane for the last 10 years. Only small branches were injured by the long spell of below-zero temperatures during the winter of 1948–49, and every effort will be made to preserve these relatively hardy specimens.

The value of trees for their flowers may often be incidental to the greater value for autumn foliage and fruits. This is true to some extent in the case of the many hawthorns. For flowers we are apt to turn to the forms of the English Hawthorn (*Crataegus oxyacantha*) because of their outstanding rosettes of red, pink and white. Regardless of whether the temperatures fall well below zero or whether the summer winds reach the official "dry humidity" state, the hawthorns have been truly reliable.

Growing in favor is the Japanese Tree Lilac (*Syringa amurensis japonica*). It is a surprise to most casual observers that this spectacular late blooming (June–July) tree is really a lilac and that it is perfectly hardy and easy to maintain. With proper care, the Japanese Tree Lilac will take on a formal habit, pyramidal, characteristic of the individual creamy-white panicles. It is not a rapid growing tree in the sense that it requires frequent pruning. Even the tree in winter is picturesque because of its vertical branching tendency.

Another spring flowering tree admired for its showy panicles is the Goldenrain Tree (*Koelreuteria paniculata*) or the Varnish Tree as it is sometimes called. The rough-textured light green compound leaves hold their color throughout the summer even when grown on very dry soil conditions. In July the crown of the tree is surmounted with

McFarland photo

Flowers and foliage of the Tuliptree (*Liriodendron tulipifera*)

erect panicles of lacey golden flowers. This tree blooms at a time when most of the flowering trees have ended their display. Equally attractive are the papery pods which linger on into the fall after the leaves have fallen.

In protected locations, the Chinese Scholartree (*Sophora japonica*) can be grown in eastern Washington. However, the number of them now in cultivation is small, and most of the specimens are young. Because of their particular adaptability to extremely dry conditions, it is possible that further success will be attained through more extensive plantings. The Scholartree is conspicuous for its very graceful foliage, vivid green twigs, and panicles of pea shaped yellowish-white blooms appearing late during the middle of the summer.

An easterner who has experienced the heavy fragrance of the Black Locust (*Robinia pseudoacacia*) or Yellow Lo-

Richard Averill Smith

Horse-Chestnut (*Aesculus hippocastanum*), when old, frequently makes a majestic tree

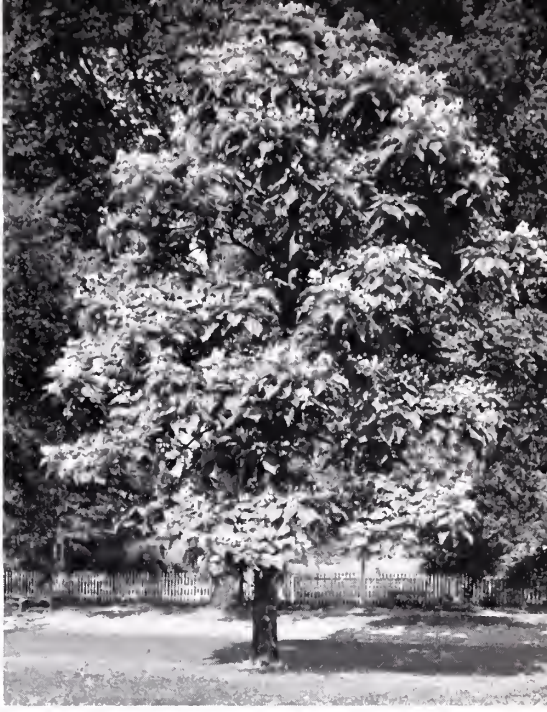
cust during its flowering season in Virginia or Maryland, cannot appreciate the value of a humid atmosphere to that experience. The locust has been for years the most common rapid growing tree planted in towns and cities of this region. Unfortunately it is subject to the same borer troubles, dead twig shedding, and early leaf drop, characteristic the country over. In addition, the fragrance

of the flowers is generally absent altogether because of the dry atmosphere. *R. pseudoacacia unifoliola* is now used more satisfactorily than the common species. Pink flowering forms such as *idahoensis* are in demand for plantings formerly given over to the common type.

Of the large trees worthy of mention, we should consider the Horsechestnuts. The regular Horsechestnut (*Aesculus hippocastanum*) has been widely planted in the west. Where ample moisture is provided it is free from leaf scorch; however, the difficulties of lawn maintenance beneath horsechestnuts have caused many people to avoid planting these trees on private grounds. The Red Horsechestnut (*Aesculus carnea*) is more distinctive in many ways and has been planted in preference to the common horsechestnut. The coarse-textured dark green foliage and the dark red fragrant flowers attract a good deal of attention. It is a wide-spreading rather informal tree with smooth gray bark. From the time the first florets open, the trees are swarming with humming birds. In the fall the large fruits almost without spines attract the children. The various species are subject to severe injury from winter splitting of the bark. In some instances large specimens of *Aesculus carnea* have been split through the entire diameter of the trunk because of sudden drops in temperature. This results in serious weakening of the trees and the necessity of skilful bracing.

The best of the catalpas for this region is *Catalpa speciosa* referred to as the Western Catalpa. It has been planted primarily in parks and on the lawns of large private grounds. The much abused cousin, the Umbrella Catalpa (*Catalpa bignonioides nana*), has been extensively planted in the obviously inappropriate locations, but there seems to be a definite trend away from the further use of these scarecrows.

Another large tree conspicuous for its flowers is the Tuliptree (*Liriodendron tulipifera*). Here we have a tree of great beauty and one which when once established will reward the plantsman for his efforts. It is a park tree or large estate tree requiring well-drained deep soil and protection from direct drying winds. Unfortunately, the Tuliptree can be moved only with difficulty. The fleshy roots are easily injured, making it necessary in most cases to rely on small trees for plantings. The unique tulip-shaped blossoms never fail to delight any person who sees them, and wherever sufficient room is available a Tuliptree should be tried.



McFarland photo

A twenty-year old Catalpa Tree (*Catalpa speciosa*)

Such are the types of trees which "have to take it" in the trying climate between the Cascades and the Rockies. Hardly 300 miles to the west is another country, the Pacific Coast, with its mild humid seasons tempered by the winds and fogs from the ocean. Flowering trees in abundance, all of those which we have been considering, and others requiring acid soil, frequent rains, a minimum of freezing weather, may be found within a few hours' drive from this Inland Empire.

THE DOGWOODS

Flowering trees and shrubs

John C. Wister

THE MOST beautiful and spectacular of our spring flowering trees along our eastern seaboard from Maine to Florida and inland as far as Ontario is the Flowering Dogwood (*Cornus florida*). Long taken for granted while the beauty of the Asiatic Cherries and Apples was extolled it is now coming into its own and is being planted in great numbers. The fame of the Dogwood season at Valley Forge is partly responsible in bringing this tree to the attention of gardeners. Another factor in its upswing in popularity was the work of Adolf Mueller, a Pennsylvania nurseryman, who during the last half of his life devoted most of his time to propaganda for the Dogwood. He talked about it, lectured about it, wrote about it, photographed it, grew it in his nursery and gave away more plants than he sold for the purpose of lining our highways. The Blue Star Highway project came after his time but was undoubtedly made possible by the years of devoted work Mr. Mueller had spent to make people aware of the many fine qualities of this tree.

It seems strange that the American public has to have propaganda to make it appreciate our native plants. But it has been true since the days of the earliest settlers that exotic plants have been the first choice. It was natural enough that they should want the Lilac, the Mock-Orange, the Apple, the Pear, the Daffodil and the Tulip which they had grown and loved in their European homes, but it is hard to understand why the beauty of the Dogwood failed to impress them.

The Dogwood as we see it along the borders of our woods is commonly 15 to 20 feet in height. Occasionally it will grow to 30 or 35 feet or more and in open meadows it will be as broad as it is high. It is covered with large white flowers (actually bracts, the true flower in the center is small and inconspicuous) in mid-May in the latitude of New York. It makes entire hillsides white as though hit by a sudden snow. Then in September and October it is almost equally spectacular with its bright red fruits and its gorgeous orange, scarlet, and crimson foliage. Even in winter the beauty of the pattern of its branches and twigs makes it outstanding and it becomes spectacular after each snow that clings to it, or when rain freezing on the branches makes it sparkle more than any Christmas tree.

John Banister, an Englishman who explored in Virginia about 1680, was apparently the first to be impressed by the beauty of this flowering tree. From his letters another Englishman, Leoneen Plukenet, described it in 1691 and within 30 or 40 years it was being cultivated in England. It proved a great disappointment there for it is not adapted to the even moist climate of the British Isles. It needs hot summer sun to ripen its wood properly but it does not like extreme cold and is of doubtful value in Maine or in the cold states west of the Mississippi, although occasionally some skilled gardener grows it successfully even there.

The Flowering Dogwood is not too easy to transplant. Most nurseries offer small plants balled and burlapped. The three- to four-foot size is the best for most planting and even they do not always stand the shock of moving. They are very subject to drought injury even three or four years after being moved and also subject to attack by borers. Move them in the spring, protect from the hottest sun the first few years, and keep well watered until they are really well established. I hope this comment

Richard Averill Smith

Flowering Dogwood (*Cornus florida*) gives spring charm to the small garden

will not frighten away our timid gardeners. They can find plenty of instances where the trees have withstood transplanting without special care.

Various forms of the Flowering Dogwood are offered in nurseries. The most popular is the Pink Dogwood, a botanical variety, *Cornus florida rubra,* named and described by the British botanist Richard Weston in 1770 but said to have been known as early as 1731 when it was recorded by Catesby. In nature various shades of pink are to be found but it is believed that these variations may be due to soil condition. In any case, only one color (and a pretty harsh one at that) is in general commerce. With plenty of white around it it is very handsome but it cannot be placed near late flowering Japanese Cherries, or near some of the pink Crabapples or the forms of *Azalea kaempferi* without danger of violent color explosions.

A double-flowered form (var. *pluribracteata*) was introduced into commerce by the Lindley Nurseries of North Carolina in 1913. It is often advertised as "Gardenia-Flowered" but it has never gained an important place in gardens. Botanists describe also a variety with yellow fruit which is different but hardly as attractive as the more common red fruit.

Any careful observer will notice that Dogwood flowers are not all alike. Some are larger, or more glistening white than the common run. Some enterprising horticulturist should seek these out and propagate them and test them to see if the improvement is inherent or merely the result of a favored location. As far as I have record only one such form has been offered commercially. This is the variety "White Cloud" introduced this past year by Wayside Gardens. There have also been reports of some varieties with flower bracts 6 inches in diameter but these have always been difficult to locate definitely.

What the Flowering Dogwood means to our eastern gardens is best represented on our west coast by the Pacific Dogwood (*Cornus nuttalli*). This is a larger tree to 75 feet high. It grows from California to British Columbia. As the predominating forests of the west coast are so much taller than eastern forests the relative effect is much the same. *Cornus nuttalli* is an important garden tree in the Puget Sound area but is not hardy inland or on the east coast.

We can, however, grow here a Dogwood from the opposite side of the world. Many a garden is made gay after our Dogwood is over by the flowers of the Japanese Dogwood (*Cornus kousa*) from Japan and its variety *Cornus kousa chinensis* from China. These trees will grow 15 to 20 feet high and across, and their starry white flowers come in June after the foliage is fully developed and make a charming contrast with the bright green foliage. The autumn foliage is brilliant scarlet. The two varieties are much alike and the Chinese one is probably to be preferred where both are available. Seedlings also vary a good deal and in the future especially fine ones will probably be segregated and offered under vernacular names.

These three species *florida, nuttalli* and *kousa* are conveniently grouped together because of their conspicuous flowers (bracts). But there are various other species of totally different effect. One cultivated since ancient times is nowadays but seldom seen. This is *Cornus mas,* sometimes called Cornelian Cherry. It is a native of Europe and Asia, will grow 10 or 20 feet high and across and was much grown here for its tiny yellow flowers which covered the bush in March and early April. The advent of the Forsythia dimmed its popularity. It cannot compete with the Forsythia for brilliance or rapid growth or ease of propagation but it fully deserves a place in the large shrub border. *Cornus officinalis,* a closely related species from Japan and Korea, is somewhat smaller and more graceful.

Botanists profess great interest in *Cornus alternifolia,* native from Nova Scotia to Georgia and west to Missouri,

For late flowering try the Japanese Dogwood (*Cornus kousa*)

Arnold Arboretum photo

because it and its asiatic relative *Cornus controversa* are the only species with alternate leaves. It is not particularly ornamental and is seldom found in gardens or in nurserymen's lists. *Cornus controversa*, while introduced into cultivation before 1880, is not often seen outside of botanical collections. In its native land it grows to 60 feet in height.

All of the species so far mentioned are best considered as small trees rather than shrubs, although in a plant like *Cornus officinalis* it is hard to know where to draw a rigid line between the two categories. All are relatively slow in growth with hard wood which requires little if any pruning. All should be moved carefully with a ball. All are best propagated by seed, the varieties by grafting or budding. They cannot under ordinary conditions be grown from cuttings.

In contrast the species now to be listed are dense, quick growing shrubs requiring severe pruning to keep shapely or in bounds, usually by cutting out entirely older branches because the young wood is the handsomest and most desirable. They root easily from either soft wood cuttings in early summer or hardwood cuttings taken in winter. They often layer naturally or grow from stolons taking up more and more space if not carefully kept in bounds. Their flowers are often attractive but not spectacular and are not as often noticed as the fruit which is of great beauty, or as the winter effect of the stems. All are subject to scale insects but their attacks are easily controlled by pruning of the old wood and by spraying.

Space will permit mention of only a few of the most widely grown in gardens. All will grow from 6 to 10 feet in height and wider than high.

Cornus amomum, the Silky Dogwood, is a splendid big coarse shrub for bound-

Cornus controversa is an Asiatic relative of the native dogwood.

Flowering branches of Cornelian Cherry (*Cornus mas*)
H. Howard photo

ary planting and for screens. Its branches turn purplish red in autumn and are handsome throughout the winter, but not spectacular. It is too big and not good enough for the ordinary garden or small suburban grounds yet I would tab it one of my favorites on the larger estate or park.

For the most brilliant red stems in winter, *Cornus alba* (and particularly its variety *sibirica*) and *Cornus stolonifera* stand out. They will brighten the entire shrubbery, furnishing an amazing contrast to the dingy stems of so many of our favorite plants. They cannot be too strongly recommended.

In contrast to the red stems of these two or the stems of *C. amomum* are the yellow stems of *Cornus stolonifera* var. *flaviramea*. This variety like its parent species tumbles along and takes up more room that most gardeners can spare. It must be kept in bounds. It can even be entirely cut to the ground occasionally, for the young stems are the most brilliant in color.

For an added contrast of green twigs, *Cornus sanguinea viridissima* is useful, and while not as generally available as the others can be had from a few nurserymen.

Cornus racemosa is an attractive shrub often seen in old pastures or meadow land but hardly of sufficient interest to warrant its use on the small place. The same is true of a number of other species popular in botanical gardens and carefully described in botanical literature. Perhaps they have not been grown in enough gardens to have been evaluated properly or to have had superior forms recognized and propagated. In the more popular species nurserymen have seized upon the opportunity to perpetuate freaks with striped or mottled foliage or stems, most of which have little or no value as ornamentals. It is to be hoped that the use of these less desirable forms will be eliminated and that magazines like PLANTS & GARDENS will continue to call attention to the species and varieties that are best for garden use.

THE RUGGED HAWTHORNS

Handsome and desirable

Henry Teuscher

WHEN ORNAMENTAL flowering trees are considered, hawthorns certainly cannot be left out, since especially certain species, which develop into medium-sized trees, produce their showy white flowers in such abundance that they are conspicuous from a considerable distance. The picturesque shape which the crowns of these trees frequently assume at maturity adds to their attractiveness, and the bright red berries which cover the branches in fall—providing a feast for birds and incidentally also for small boys—lend to hawthorns a double or triple value in ornamental garden or park plantings. Red and pink as well as double red, double pink and double white flowered forms of the English Hawthorn (*Crataegus oxyacantha*) offer variety in color, though the double-flowered forms have the disadvantage of being sterile and, therefore, produce no berries.

Handsome and desirable as the hawthorns are, they have one rather unfortunate attribute of which it is well worth while to be aware. This is the unpleasant odor of their flowers, reminiscent of salt herring. Actually the substance responsible for the odor is chemically the same (Trimethylamine) in both hawthorn flowers and herring's brine. Outside, in garden or park, this odor is hardly strong enough to be objectionable but inside the house it can be definitely annoying. Cut branches of hawthorn in flower are for this reason quite unsuitable as room or table decoration, but what is still more important, one should take care not to plant hawthorns so close to the house that the odor may be wafted inside. Since, as with all woody plants, so also with hawthorns, a number of years are required before the tree attains flowering age, it is decidedly advantageous to consider this point before planting, instead of risking later on the heartbreaking decision that a handsome specimen must be removed because of the annoying odor of its flowers.

Before going on to the more pleasing aspects of our theme: "Hawthorns as flowering trees in garden and park," we might as well consider one other fact which is likely to lead us into grief if we overlook it. This may be summed up in the short sentence: "Hawthorns and native Junipers are bad neighbors and must never be planted together." The reason is that they serve as alternate hosts for a parasitic rust fungus which disfigures both plants. The fungus can develop only if both hosts are fairly close together (300 yards or less), since it passes through different stages in its life cycle on each. Separation, therefore, serves perfectly as a control measure. As can be seen, the disadvantages which may accompany hawthorn planting are minor ones and indeed fewer than with most other plants. They can easily be by-passed if we are aware of them, and it is for this reason that they were mentioned first.

Requirements

On the other side of the ledger must be mentioned, besides their refreshing beauty, the extreme ruggedness of these trees. This includes hardiness and wind-resistance but also a rather unique ability to thrive on nonfertile soils. The only soil condition which defeats a hawthorn is one which is distinctly acid or which is wet, boggy or peaty. Sand (as long as it is near neutral in reaction) or heavy clay (as long as it is not permanently wet) seems to make little difference. Even on subsoil, from which the

topsoil has been removed, hawthorns manage to get established and to survive. Stony hillsides appear to offer particularly favorable conditions, but this does not mean that hawthorns require a poor soil. They thrive extremely well in rich loam soil provided that drainage is satisfactory. Actual requirements may be summed up as: good drainage, full sun and a near neutral to alkaline soil reaction.

Many Varieties

The choice of suitable varieties is extremely wide and is complicated by the fact that the genus *Crataegus,* which finds its most profuse development in North America (there are also European and Asiatic species), contains over 1,000 species. For the plant lover who is interested in handsome hawthorns it does, of course, make a difference whether he lives in New Mexico or in Eastern Canada. Naturally, the same species cannot be expected to be equally satisfactory everywhere, though, happily, there are ample varieties to choose from for all kinds of climatic conditions. Which kinds then should one choose? A list of the botanical names of desirable species is of very little help to the amateur because only few of these are available from nurseries, and to find the others in their wild habitats is not easy because of the enormous number of other species from which they have to be distinguished.

Growing from Seed

However, there is an easy way out which does not require botanical knowledge. This consists in raising from seed, without regard to botanical name, whatever particularly attractive hawthorn one may observe either in one's own vicinity or wherever else similar climatic conditions prevail. The interesting point is that hawthorns come very faithfully true to type from seed, even if the fruits are gathered from a tree in an arboretum collection where dozens, or perhaps even hundreds, of species were planted side by side. This strange disinclination to hybridize is caused by the ability of most hawthorns to produce fertile seeds. The scientist calls this phenomenon apomixis.

To raise hawthorns from seeds is extremely simple and sure. All one needs to do is to gather the fruits in fall as soon as they are ripe, free the seeds from the pulp (this is important), and to sow immediately in a bed or coldframe with well-pulverized soil, covering the seeds to a depth of 1/2 inch or slightly less. It is advisable to place a 1- to 1½-inch mulch of leaves over the seedbed after sowing, since this will help to prevent heaving, caused by alternate freezing and thawing, which would bring the seeds to the surface. The leaves may be kept in place by sprinkling a little soil over them.

Now comes the one and only hitch in this whole procedure for which one must be prepared or one might be disappointed. This is the fact that hawthorn seeds rarely germinate the following spring even if sown in fall. Usually they remain dormant for 18 months and germinate (50 to 75 per cent) during the second spring after sowing. If the whole fruits are sown, or if the seeds are kept dry during winter and are sown in spring, it may take twice as long or even longer. This is why cleaning of the seeds and fall sowing is recommended. The delay of a whole year, which is likely to make us impatient, is, however, not as much of a loss as it may seem, since it is largely made up by the rapidity of development which follows germination. During their first season of growth hawthorn seedlings usually reach a height of 10 to 12 inches or even more and thereafter continue to grow at the rate of 1½ to 2 ft. or as much as 3 ft. per year. Seven to eight years after germination the young trees should be 12 to 15 ft. high and usually commence flowering. The best stage in development for setting out young hawthorns into their permanent place is when the seedlings are 2 or 3 years old.

McFarland photo

English Hawthorn (*Crataegus oxyacantha*) is very handsome in flower.

Desirable, tree-like hawthorns which are available from American or Canadian nurseries (all those in the first four groups have white flowers and showy red fruits):

I. Handsome in flower, fruit, and fall coloring of leaves. Bright red fruits remaining on the twigs most of the winter: *Crataegus crusgalli, C. lavallei (C. carrieri), C. fontanesiana.*

II. Handsome in flower, fruit, and fall coloring of leaves. The bright red fruits are retained less long than those of the first group: *Crataegus coccinioides, C. nitida, C. phaenopyrum* (*C. cordata,* Washington Thorn).

III. Handsome in flower and fruit, but fall coloring not outstanding: *Crataegus pedicellata, C. sanguinea, C. succulenta.*

IV. Handsome in flower. The bright red fruits are comparatively large and meaty but fall early. Very little fall coloring: *Crataegus arnoldiana, C. ellwangeriana, C. mollis, C. submollis.*

V. Very handsome in flower, but no fruits are produced and the leaves do not color in fall: *Crataegus oxyacantha* var. *pauli* (var. *splendens,* Paul's scarlet), double scarlet, *C. oxyacantha albo-plena* (double white), *C. oxyacantha rosco-plena* (double pink).

THE FRANKLIN TREE

Named for the early Statesman

Charles F. Jenkins

THE ROMANTIC story of the discovery in 1765 and the historical background of the "Lost Franklin Tree," *Franklinia alatamaha*, have been often told. There is considerable interest and curiosity about its every-day performance in sections where it is still not well known. Your Editor has asked a series of eleven questions to which he has invited answers. Philadelphia has always been the center for this charming tree ever since William Bartram, traveling up from Georgia on horseback, in 1777, brought some cuttings or seedlings and planted them in Bartram's Gardens, now a Philadelphia City park. In time the gardens became neglected and a cow, browsing around, horned the tree severely and it was only saved from extinction by a nearby florist who made cuttings from the damaged branches.

For a period of about seventy-five years, it was very rare and the owner of any old garden having a flowering plant was indeed a horticultural aristocrat. It was mainly in the suburban Germantown section of Philadelphia that it was cherished. But even there no one was successful in growing it from seed or rooted cuttings, so that its propagation was almost entirely by layering. The largest tree in the Hemlock Arboretum at "Far Country," Germantown, was produced in this way. A lower branch of a tree in a friend's garden was laid on the ground and held there by a large stone. In three years it had taken root. The branch was then cut off from the main stem and given two years more to grow on its own. It was indeed a thrilling moment when a telephone message came saying "Your Franklin Tree is ready for you, come and get it."

Propagation and Culture

It was at the Whitesbog, N. J. nursery of the White's where the Franklin Tree was first grown in quantity. They were experimenting with and developing the wonderful blueberries which, in recent years, have become so popular, and learned through the cooperation of the scientists how to propagate Franklinia on a commercial scale. They handled the Franklinia cuttings as they handled the blueberry cuttings. When the plants were pruned up for shipment in the early spring the trimmings were planted in lath-shaded cutting bed of peat and sand. Handled thus they rooted as easily as willow cuttings. It was too bad that the old time gardeners did not know the trick a hundred years ago!

The tree does well around Philadelphia. It seems not too particular as to soil, as it will be found flourishing in many small city back yards. It grows as far north as Boston although it is sometimes killed back in winter, sprouting up again in the spring. Our experience, and that of numerous friends, has been that it takes some time for the tree to recover from the shock of transplanting, even with a good ball. Most of these have come from nurseries having a loose sandy soil. The roots stretch out for moisture and when dug a good proportion were cut off. In several cases it has taken two or three years for the tree to begin making a vigorous growth, so don't be discouraged. They begin to bloom when from four to five feet tall.

Tree or Shrub

Whether to call it a "tree" or a "shrub" must be a matter of opinion. Our best

plant is now twenty years old and eighteen feet high. Dr. L. H. Bailey says it grows to 30 feet but I have never seen one so tall. It does, however, grow more like a shrub with a number of ascending branches from the lower trunk.

No Special Pests

With us the tree has no insect enemies, except when the Japanese beetle was at its height they delighted in eating the golden stamens but not the leaves. In the mornings the whole cup of the bloom would be filled with the beetles eating away forming a dense black cluster.

Year-round Beauty

All through late July we watched the buds forming, in a close cluster of five or six, growing whiter day by day. These are about the size of small gooseberries. August 1st for many years has been the date of its first unfolding and inquiry among other *Franklinia* owners shows that this year it was a day ahead of time, the first bud opening fully on July 31st. The petals are creamy white with a gorgeous center of golden stamens. The flower is 2½ to 3 inches across and lasts a week or ten days, depending on the weather, when the petals drop off and a new bud in the cluster opens. The tree will have flowers on it up to frost which, with us, is about November 1st, giving it a three months' period of florescence. With us no other plant, at this time of the year, has such a long blooming period, unless it might be the Rose of Sharon.

The bark on the limbs is clean, smooth, gray striped with brown, and is interesting looking throughout the year and particularly attractive in the winter. The showy, glossy leaves, somewhat resembling a magnolia at a distance, are bright green and shiny above and pubescent underneath. They are irregular in length, from five to seven inches and one and a half to two inches in width. The flowers have a slightly pleasant, subtile odor. Even without the bloom the tree would

McFarland pho

Flowers and foliage of the Franklin Tree (*Franklinia alatamaha*)

be well worth planting as an ornamental. As fall approaches the leaves turn a gorgeous scarlet. A number of years ago an acre patch of young plants, three to four feet high, growing at Whitesbog, was a sight never to be forgotten.

Yes, everyone who has a garden space of, say, twenty by twenty feet, in full sun with good average garden soil, bordering on the acid side, should have a Franklin Tree. They will get the greatest enjoyment out of it. Give it a good mulch of well-rotted oak leaves, or peat moss, or pine needles, every autumn and let the mulch rot away during the summer, have a comfortable seat near by and sit and enjoy it to the uttermost.

Many gardens around Philadelphia are growing it, not only for its inherent beauty, its long period of florescence but as a memorial of the great Philadelphia philosopher, Benjamin Franklin. It is the only plant named for him. The gardens surrounding the institutions which his foresight and beneficence founded,

Author photo

A sixteen-year old Franklin Tree (*Franklinia alatamaha*) at "Far Country"

the Pennsylvania Hospital, the American Philosophical Society, the University of Pennsylvania, all are conscious of the association and are planting it now that it is available. There is a great group of old specimens south of our Horticultural Hall, in Fairmount Park. Young plants are now obtainable from practically all the leading nurserymen and at moderate cost.

FLOWERING TREES

. . . *for Florida Gardens*

John V. Watkins

IN THE southeastern United States are to be found some of the truly beautiful landscape developments on this continent. Basic to any such development is the proper selection of hardy, flowering trees. In the Gulf regions of the South there are many species of magnificent woody trees that are widely employed with telling effect, and some of the best are discussed here.

Links with Northern Trees

Three genera, particularly, link our landscape pictures with those of temperate regions. These are *Magnolia, Cercis* and *Cornus,* adequately discussed in other articles of this issue.

The most beautiful of all broadleaved evergreen trees is the Southern Magnolia. Extolled in story and film, this beloved tree is well known to everyone who has visited the Lower South; it is a cherished possession of home owners in this section. A forest tree which grows to a height of more than a hundred feet, *Magnolia grandiflora* is most spectacular in springtime when graced by its fragrant white blossoms. Yet, at all seasons, the grand magnolia is made handsome by its compact growth and beautiful waxy, persistent foliage. Preferred by most advanced gardeners are grafted, nursery-grown trees because they can be depended upon to develop attractive, compact habits of growth, foliage that has beautiful brown undersurfaces and huge blossoms.

Throughout the Lower South, too, the Mimosa has long held a place of affection with home owners. Because of its unquestioned adaptability, small size, horizontal branching, lacy compound foliage and attractive springtime blossoms, *Albizzia julibrissin* from Persia is widely planted here.* It is possible to secure forms that have blossoms of deep pink, while others may produce puffs that are almost white. Then, too, some types flower earlier than others. In sections of the South where vascular wilt has caused losses in Mimosa plantings, perhaps nurseries will follow the lead demonstrated by research, and produce resistant forms by root cuttings. As this is written, vascular wilt has not been reported in Florida.

Crape Myrtle

In the opinion of some gardeners, the genus *Lagerstroemia* contains the best of the flowering trees of the tropics. The Crape Myrtle (*Lagerstroemia indica*) may be seen as a shrub or tree from the mid-cotton belt down through, and including, all tropical regions. Flowering on current growth that elongates after leaves appear in springtime, the huge terminal panicles of white, pink, red or purple are borne at the beginning of the rainy season. Widely adapted to many soil types and different climates, this deciduous tree is seen everywhere in mild climates. This gardener will agree with the Superintendent of Hope Garden in Jamaica in his statement that the Crape Myrtle is one of the finest flowering species for the tropics.

Even more spectacular than the Chinese species above is the Queen Crape Myrtle (*Lagerstroemia speciosa*) from India and Australia. This is a tree which acquires a height of 60 feet and has upright growth which carries large, rough

* The Hardy Mimosa or Silk tree thrives as far north as Long Island and along the coast to Boston. It appears in full color in this issue; for details see Mr. Frank Bailey's article on page 103 of the 1948 summer issue of PLANTS & GARDENS.—ED.

deciduous leaves. The terminal panicles, up to two feet in length, are produced by current growth and are made up of gorgeous blossoms about three inches across. In the Antilles, the Queen Crape Myrtle is a great favorite and this is easy to understand if one should visit the Islands, as I did, during the June–July rainy season. I think I shall never see a tree more beautiful than the flowering Queen Crape Myrtle that I looked down upon from the upper floor of the College of Agriculture Building in Mayaguez, Puerto Rico.

Lignum Vitae

A tree that fulfills all of my requirements for a top-flight ornamental and one that appears in too few lists and practically no nursery catalogs, is the Lignum Vitae (*Guaiacum officinale*). This is a small, slow-growing tree that has foliage of finest possible texture, a very compact round head, beautiful small blue blossoms and bright yellow fruits. All of these characteristics combine to make the Lignum Vitae a tree of great distinction and of more than ordinary usefulness as a dooryard tree for a small residential property. In the vicinity of Kingston, Jamaica this native tree seems to be accepted for its full worth, and I sincerely hope that it will find wider usefulness as time passes.

Royal Poinciana

Toward the tip of the Florida peninsula killing frosts are infrequent, and here, some of the world's most attractive flowering trees are to be found. Probably first place must be given to the Royal Poinciana (*Delonix-regia*). Widely planted in tropical regions the world around, this striking member of the Legume family is acknowledged to be the most striking tree known to gardening. The lacy, compound leaves appear in springtime, and as the rains commence, the flaming orange-red trusses are produced. To visit Miami or any of the Caribbean lands in June–July is a rare treat as then, these flamboyant trees are at their best. Usually increased by seeds, there are color variants from the orange-red type.

The Cassias

The Cassias will be rated very high by discerning gardeners. *Cassia fistula,* the Golden Shower, is well liked, and much seen in tropical lands. Like so many of the legumes, this tree flowers in early summer and so it is not seen by the majority of the winter residents. This tree, grown from seeds, is easy to come by and well worth growing in frost-free sections. *Cassia nodosa* is a beautiful pink flowering tree that pleased me greatly on my 1949 Caribbean cruise. In many lands, this attractive Cassia is a favorite dooryard and roadside tree. Perhaps even more beautiful is the gorgeous Apple-Blossom Cassia (*Cassia javanica*) and in Cuba, Jamaica and Puerto Rico this is rated very close to the top of all lists of worthwhile flowering trees.

This genus, according to Bailey's Cyclopedia of Horticulture, contains at least 400 species, and so it is seen that there is a tremendous potential for gardeners within this great section of the *Leguminosae.*

Orchid Tree

A genus in the same family, of more than passing interest, is *Bauhinia.* Small deciduous trees that bear large, showy papilionaceous flowers in early spring, the species *B. monandra, B. variegata* and *B. purpurea* are much seen in frost-free lands. Fortunately, these colorful little trees are easy to grow from seeds, and, if they perish after storm- or cold-injury, it is not difficult to grow more. *B. variegata* is generally called the Orchid Tree.

African Tulip-Tree

African Tulip-Tree (*Spathodea campanulata*) is admired when its showy flowers are produced in sheltered places on Florida's lower east coast. There it is employed both in dooryard and avenue

Edwin Menninger

The Golden Shower tree (*Cassia fistula*)

A single flower of *Pachira macrocarpa*

plantings. The handsome, tall evergreen tree, though native to tropical Africa as the common name suggests, is distributed in the American tropics to the extent that it is sometimes called Santo Domingo Mahogany. This and the closely related genus which follows are prominent arborescent members of the Bignonia Family.

Tabebuia

Tabebuia is a genus of American evergreen (sometimes deciduous) trees to which botanists ascribe a hundred species. Mr. Edwin Menninger, the outstanding authority on flowering trees of Florida, showed me many members of this genus growing in his experimental plantings at Stuart, Florida. He extolls the merits of this group as he has great faith in its future for Florida plantings. Generally producing terminal panicles of trumpet-shaped flowers and behaving well on poor soils that may be deficient in moisture, this large genus of trees promises much for frost-free gardens and municipal plantings.

The Kapok Tree

The Kapok Tree (*Ceiba pentandra*) is prominent in tropical locations from the aspect of grandeur. Growing to fantastic heights, with huge buttressed trunks, this deciduous giant is spotted at once by all travellers in the American tropics. When the leaves are gone, clusters of small pink flowers appear, later to be followed by the fruits which bear the kapok of commerce. Every tropical metropolis (Miami, Nassau, Havana, Kingston) has its famed Ceiba Tree that is adequately exploited as a tourist attraction. This mammoth Bombax is too large for home plantings and must be restricted to municipal properties where it may assume its stature as a true giant.

The yellow trumpet-shaped flowers of deciduous Tabebuia lend a bright note to frost-free gardens.

Edwin Menninge

Tropical Almond

Favored for avenue plantings in Miami, Havana and San Juan is the exotic-looking Tropical Almond (*Terminalia catappa*). Its striking horizontal branching, smooth brownish gray bark, and stiff magnolia-like leaves account for its popularity. Principal color is contributed by the leaves which turn red before shedding. This leaf fall may be caused in Florida by cool weather, in the Antilles by the excessive droughts which recur regularly. Though there are 100 species in *Terminalia, T. catappa* is most widely seen in the New World tropics. Mr. Menninger has grown a baker's dozen in his garden at Stuart, Florida.

Frangipanis

Frangipanis are American trees or shrubs, much planted in tropical lands for their delightfully fragrant flowers. Of the seven species indigenous to the West Indies, two are most widely seen. *Plumeria rubra* has broad leaves with conspicuous marginal veins and red, pink or purple blossoms, while *Plumeria alba* has leaves half as wide, without the heavy veins along the edges, and, as the specific name implies, is typically white-flowered. The thick, fleshy, sausage-like branches support tufts of leaves near their tips and, in summertime, the terminal clusters of spicy blossoms. Much planted in dooryards and cemeteries, Frangipani is among the most popular of small flowering trees in tropical America.

My first Frangipani came to me years ago from Hawaii when a friend went to a great deal of trouble to secure cuttings by air mail. Used in the land of Aloha for making leis, Frangipani is thought of perhaps as an Old World plant, when actually it is native to our own West Indies.

New York Daily News

WITHIN THE BROOKLYN BOTANIC GARDEN

Winter Bloom

A tour of the Garden at the end of February revealed that nine different kinds of plants were in bloom. Some of these might have been missed by the casual observer, but their presence brings out the interesting fact that flowers may be found in the Botanic Garden during every month of the year. This is no accident—but the result of careful planning many years ago. Those in bloom were: Winter Jasmine, early Crocus, Snowdrops, Chinese Witch-hazel, Adonis, two species of Pussy-willow, Parrotia (a small tree with deep red flowers not unlike those of the witch-hazel) and one of the early Dogwoods—*Cornus officinalis*—which has tiny golden flowers and is similar to but earlier than the Cornelian Cherry (*Cornus mas*).

Plans for Botanic Garden Week

The blossoming of the Oriental Cherries shown above and in the color picture elsewhere in this issue will again provide the floral background for Brooklyn Botanic Garden Week.

Because of the vagaries of the weather, it is not yet possible to say whether the third annual Botanic Garden Week will be held the end of April or the first week in May.

Definitely scheduled for May 1 is the Festival on Cherry Esplanade. More than 4,000 high school girls will participate in the colorful ceremony, and the crowning of the Cherry Blossom Queen.

One of the special events planned this year is a conference on civic-sponsored plantings of flowering trees and shrubs in public parks and streets.

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BROOKLYN BOTANIC GARDEN RECORD

PLANTS & GARDENS

Summer
1950

TREE PEONIES

DWARFED TREES

ORIENTAL POPPIES

LILIES

WINDSWEPT TREES

FINGERS IN THE SOIL

NEW SERIES
VOL. 6 NO. 2

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PLANTS & GARDENS

Styrax japonica

VOL. 6 Summer, 1950 No. 2

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This issue compiled by the Editorial Committee of the Brooklyn Botanic Garden
MICHALENA L. CARROLL, *Assistant Editor*

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McFarland photo

Korean Stewartia

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Summer 1950

To Readers of PLANTS & GARDENS:

Since the special issue in the autumn of 1949, we have had many inquiries about dwarf plants. Readers will recall that these plants are divided into three categories. Two groups grow slowly and remain small because of their inheritance, i.e., regardless of growing conditions, they are always dwarf plants. The third group includes dwarfed potted trees - which remain small because they are never given a chance to grow larger. Keeping a tree that would ordinarily grow to a height of 100 feet, or more, down to a foot or so - and keeping it alive for one to two hundred years, calls for special horticultural skill. The Japanese have it, so we went straight to Japan for another article on the subject. It is with special pleasure that we bring this article to our readers because we feel that dwarfed plants ought to have as much of a place in the occidental world as they do in the Orient.

The several articles on lilies supplement the more detailed treatment of the subject in a previous issue. Oriental poppies and tree peonies deserve the attention of all who seek feature plants for their gardens. For tree behavior high in the Rockies, be sure to read "Windswept Trees."

The autumn issue will contain among others a number of articles about herbs - under the editorial guidance of Elizabeth Remsen Van Brunt and Helen Morgenthau Fox.

Sincerely yours,

George S. Avery, Jr.

Director

Stewartia deserves to be better known for its beautiful white flowers in late June and July, and its brilliant orange to purple foliage in autumn

Except where otherwise credited, and on page 75, photos by Louis Buhle

Sargent's Juniper (*Juniperus sargenti*). Could this be one of the "Old Timer's"?

Author photo

DWARFED POTTED TREES OR BONSAI

Their Culture and Use in Japan

Kan Yashiroda

WHEN I was invited to write on dwarfed potted trees or Bonsai, I could not help recalling a British broadcasting talk in which the speaker told us ". . . the Japanese love etiquette, formality and ceremony of all kinds, and to the average American such things are poppycock." An American Army Colonel once informed me that the purpose behind the Noh plays, the tea ceremony and flower arrangement was simply to waste time. In that view, Bonsai should be in the same category. I fully admit that there may be some truth in it, though I have the different view.

The giant Sequoia (*Sequoia gigantea*) of the Sierras, having a beautiful, sturdy pyramidal shape when young—for the

first hundred or more years; or the Yeddo Spruce* (*Picea jezoensis*) of Ezo attaining more than one hundred feet with picturesque branches, or the pure virgin forest of *Cryptomeria japonica* at Yanase silhouetting perfect form and luxury on the distant sky, are certainly, as G. K. Chesterton has said, "Unique shapes that an artist would copy or a philosopher watch for years." Japanese gardeners were greatly moved by the impressiveness of treedom, and it was the desire to copy trees in miniature shapes in their gardens and pots that produced dwarfed potted trees.

HISTORY

The history of the cultivation and appreciation of Bonsai is a very long one. The material used is almost boundless as to variety of plants and is no longer limited to the woody kinds only. Whether they are woody plants or herbaceous, dwarfing without hurting their natures, and keeping or modelling the vividness of Nature's own, are first objects in selecting and training of the material. The finished Bonsai should be roughly classified into three groups—naturally dwarfed plants; artificially dwarfed plants; dwarfed plants raised from seedlings and cuttings. Limiting myself to trees and shrubs, including conifers, I will touch on the three classes.

NATURALLY DWARFED TREES

On rocky crevices of high mountains, on perpendicular cliffs of tiny islands, on wettish bogs, and on the poorest and driest mountain slopes, some trees have lived through bravely for almost a century, or more, only growing a few feet high, panting and straining under the pressure of hard weather. Some of these trees are worthy of our appreciation of their dwarfed but stout trunks, and weather-bitten picturesque branches. The notable examples are Sargent's Juniper (*Juniperus chinensis sargenti*) of Iyo and Echigo provinces, Japanese Black Pine (*Pinus thunbergi*) of Shodoshima, Yeddo spruce of Hokkaido and the Kurile Islands, and the rhododendrons *obtusum* and *kiusianum* of Kyushu.

Sargent's Juniper dwells on high perpendicular cliffs, not accessible by climbing; however, nearly all the noted habitats are now barren of material as it was collected wantonly by the professional collectors. When I was a boy, nice naturally dwarfed trees were found, many on Mt. Ishizuchi of Iyo province. A professional collector once told me a story of the toil and superstition of his collecting, which will well illustrate how such collecting is done for a livelihood. By his keen eyes or with the aid of a field-glass, from far beneath on the cliff, he first finds a nice tree—which often may vanish into the fog above. He then seeks a suitable spot near the edge of the cliff where he may sleep for the night. Next, he draws a circle some six feet in diameter, and stands on the edge of it. He takes off his upper cloth, or working coat and places it within the circle, facing toward him. The coat is a substitute for his Deity, and he places grains of rice before it as an offering. Then he prays solemnly, "I am a dwarf tree collector by profession. Please let me rent the spot for the night." After the prayer is done, feeling that he will not encounter or meet with mischief from long-nosed goblins or monsters, he rests for the night.

In the morning he ties firmly one end of a rope to a tree trunk on the cliff's edge and the other end to his body. Holding the coiled ropes and tools such as hammer and chisel, which are used to remove the roots from the rock, and with saw, scissors and knife, he gradually works his way downward to the tree,

*Although called *Yeddo* Spruce in America, this name is erroneous. In Japan it is called *Ezo Matsu*, after its habitat Ezo—which is the island now called Hokkaido. *Yeddo* is the old name of Tokio.

The Kurume Azalea variety Aya-no-Kanmuri

Author photo

moving along the cliff. Often the tree is growing on the concave part of the cliff, perhaps underneath a protruding rock; in such cases he lowers himself by the rope to the nearby desired dwarf tree, and then swinging himself, he patiently awaits a chance to grasp the tree or the cliff nearby where he can reach the tree. The digging is a most patient and laborious work, taking many hours. Roughly describing his routine of work, the old timer had frightened me, telling, with an exaggerated gesture, how, had he not prayed, the goblin or monster might come and untie the rope while he worked on the cliff below. Oh! the good old timer is dead long ago, but whenever I recall him I recall the poem "The Last Leaf," by Oliver Wendell Holmes. Perhaps he should be called, fittingly, one of the "last leaves" in his orthodox faith and way. Good, kindly and genial man he was. It is possible that the Sargent's Juniper in the photograph is one of the trees he had collected on Mt. Ishizuchi.

Sargent Junipers growing on rocky cliffs are much dwarfed and of artistic beauty so need only a little training if any is necessary. But as they are taken bare-rooted and roughly from rocky places, they should later be given great care. They are planted and cared for for two or more years in specially prepared beds, and at the same time are trained to the desired shape. Foliage is thinned if necessary. When well rooted, and the trained branches are fixed, the trees should be placed in pottery containers. This is how naturally dwarfed trees are prepared.

Another much appreciated tree which is found growing naturally in extremely

Author photo

The Wisteria variety Issai is one of the most popular in Japan

dwarfed form is Yeddo Spruce. It inhabits wettish bogs where exposed to severe wind and cold. It is hard even for the expert to realize that other Yeddo spruces growing not far from the bog, some of them attaining a height of one hundred feet or more, are the same species. On sunny mountain slopes where the residual soil is poor and thin, Needle Junipers (*Juniperus rigida*) are found a few inches high—with crooked trunks and picturesque foliage (on which waxy, globular fruits hang in decoration). The same region produces, also, nearly naturally dwarfed Japanese Black and Red Pines. But nowadays such naturally occurring ones are rarely discovered. Sargent's Juniper, Japanese Black Pine and Yeddo Spruce are the big three among the dwarfed trees; these are extensively grown and appreciated in Japan. But owing to the demand, and because naturally dwarfed trees are limited in supply and very expensive, artificially dwarfed trees are also much cultivated.

ARTIFICIALLY DWARFED TREES

The majority of the dwarfed potted trees generally seen are developed from ordinary nursery stock or from somewhat dwarfed trees found in a natural habitat. The practice of artificial dwarfing might be more aptly described as "revolutionizing" normal growth. What, then, is this practice?

Ordinary Nursery Stock

Let me first take some examples of the ordinary nursery stock, and tell about them. Three to ten year old young trees

of the following are suitable for "revolutionizing":

Evergreens: Japanese White Pine (*Pinus parviflora*), Japanese Larch (*Larix kaempferi* (*L. leptolepis*)), Hinoki Cypress (*Chamaecyparis obtusa*), and such conifers as are grown in nurseries for ordinary garden purposes or for forest plantations.

Deciduous: Japanese Maple (*Acer palmatum* and varieties), *Daphne odora,* flowering Peach (*Prunus persica* varieties), Japanese flowering Apricot (*Prunus mume* varieties), Japanese flowering Quince (*Chaenomeles lagenaria*), garden varieties of Hall's flowering Crabapple (*Malus halliana*). Such ornamental trees and shrubs have trunks and branches that are comparatively easy to bend. They are taken from nurseries in autumn, and potted. A small pot is preferred to accustom the plant to the smaller space for root development and to restrain the growth of foliage. However, when selecting the pot, consider its depth; the shallower the pot, the better the result, but it should be of fairly generous width. When the trees are started on their way to dwarfing, they are generally planted in shallow containers, as they look better and seem to have a more aesthetic touch.

In late winter or early spring, possibly while drinking tea, you begin to fancy the shape of the tree when finished. The man experienced in training with wire changes ordinary little trees into different forms almost instantly, sometimes to a shape seen in naturally dwarfed trees. The wiring specialist's way is about like this: in the autumn the tree should have been potted so that the trunk is inclined to slant. Then in spring, to shorten the trunk in height and lower the branches, near the surface of the soil in the pot, a wire is fastened to the trunk, and again attached higher up so the trunk can be pulled downward, away from the direction of the slant. It should be fastened at the desired bend with the wire. After the operation the little tree will have been considerably lowered, and then another wire is fastened at the forked part, the end of the wire coiling around the trunk; carefully wind the wire toward the tip, having an inch or more in intervals of the spiral. The branch is then ready to be shaped and fixed to the desired form. The second upper branch is treated in the same way, then the third, and so on. After one or two years, in many cases, the trunk and branches should be settled in the desired positions, so the winding wires are no longer needed, and may be taken off. From year to year the tree is improved in form and foliage as the result of careful pinching of certain tip buds, shortening or removing undesired strong shoots, repeating the pinching often in a season according to the kind of tree and further winding the wire to change the form or improve it. Gradually the artificial look lightens and the "made-up" tree becomes the natural-looking tree. The course of training for years is very fascinating to fanciers, novices and experts alike. It is not unusual in a day's stroll in the villages or towns in Japan, wherever you may be, to come across people who train dwarf trees—they are a set of cheerful boasters.

Ordinary stocks of pines, daphnes, azaleas, maples and such ornamentals, when only one or two feet high, are often bent almost upside down, by wire-winding the trunk. Heavy copper wire is used. Every branch is also wound with lighter wire and bent so as to achieve the desired form. Whenever the wiring is practiced, before the operation takes place, the soil in the pot should be drier than usual so the trunks and branches are easily worked. Copper wire is best after it has been placed in a burning fire to make it easily manageable in the operation. Some fanciers do not like to use wire; I feel this way sometimes, too, but the operation is not so shocking as vivisection and not as unnatural as "miniature" gardens sold in America—even though the trees have been com-

pletely "revolutionized." After a course of training and settling, the trees grow naturally and look natural; the chief difference is that they grow less rapidly than the ordinary nursery stock. But normal, healthy foliage is produced in tidier textures.

Collected Stock

Now we come to the second group, the trees brought from natural habitats. From mountains and ragged woods, a tremendous amount of material is dug and brought to the training beds of dwarfed potted tree specialists each year. There it remains for several years to be established, trained and finally "made-up."

In the case of naturally occurring, partially dwarfed trees, there is need only for a few wires and a little training. Trees that have lost the greater part of their roots are a more serious problem. Some of them die because of their inadequate root system, particularly if the first summer is hot and dry. To illustrate, I now describe the collection of Japanese Black Pine. On the mountain of Shodoshima or Shodo Island which is located in the Seto Inland Sea National Park a countless number of Japanese Black Pine for dwarfed potted trees have been dug by professional collectors. Many renowned and valuable dwarfed Black Pines were produced from the material collected here. I am writing this at my home which is situated at the foot of the Shodoshima Mountain. On the islet opposite my house a Black Pine was collected many years ago, which became the most precious and dearest of all dwarfed potted Black Pines. There are still some stories or legends circulated concerning it.

Seeing the spot through Bald Cypress (*Taxodium distichum*) and Cypress-Pine (*Callitris glauca*) in the Acclimatization Gardens as I am writing, I vividly recall the days when collectors came to the island in autumn and spring. The surface rock is granite. Higher up on the mountain the rocks weather into coarse whitish sand and the layer of soil is very thin; at lower levels there is a greater depth of soil and always some moisture. The district is one of the lowest in rainfall in Japan. The summer is very hot and almost bone dry. On the upper parts of both sides of the ridge, Black Pine dominates; next comes Red Pine (*Pinus densiflora*) and in far lesser numbers the Needle Juniper, *Rhododendron reticulatum*, *Rhododendron kaempferi*, Bush Clover (*Lespedeza bicolor*) and Balloon-flower (*Platycodon grandiflorum*). The pines are very dwarfed in size but in most cases they are older than the larger ones seen at the lower levels on the mountain. Three feet is generally regarded as the maximum height of dwarfed potted trees. To keep within the golden rule of Bonsai, the larger trees are often sharply pruned. For example, on discovering a very dwarfed pine five or more feet in height with a trunk five or more inches in diameter, if the lower branches are three feet from the ground and picturesque in form (or promise to be so if trained), the upper portion of the main trunk is sawed off. It is important that when healed the cut surface should be inconspicuous. Undesirable branches are cut off. Then the digging begins. The trench is dug out carefully, cutting off all the roots outside a radius of a foot all the way around the tree, and to a depth of a foot or often less. Only the tap root remains uncut. First the straw rope is coiled cautiously and rather firmly thrice or more horizontally around the ball and then all around the surface of the ball, so the very porous, coarse, sandy soil ball is firmly held about the roots; the tap root is finally sawed through, and the tree is removed. You may wonder at the proportionately small size of the ball, but usually seventy per cent or more of the trees collected survive and become well settled as dwarfed potted trees; occasionally in very dry, hot summers, fifty

Author photo

Kurume Azaleas in full leaf—arranged for appreciation by Bonsai fanciers

per cent or so succumb. For such collected stock training by wiring is practiced generally after a year or two, when the plants are well established.

DWARFED TREES RAISED FROM SEEDLINGS AND CUTTINGS

One of the most fascinating hobbies is the raising of trees from seeds sown directly in a shallow container. If the seedlings are allowed to grow for a few years, they appear like a miniature forest; the same may be done with cuttings.

The following trees and shrubs may be sown directly in shallow containers or boxes, less than four inches in depth: Japanese maples, birches, beeches, Pomegranate, Yeddo Spruce, pines and many other conifers; also Wax-Tree (*Rhus succedanea*), Lacquer-Tree (*Rhus verniciflua*), Maidenhair Tree (*Ginkgo biloba*), *Cryptomeria japonica, Ilex serrata* and *Zelkova serrata.* When the young seedlings are established they may be transplanted thickly to another shallow container or singly to a pot. The single planted ones in thumb pots should be shifted to slightly larger pots every two or three years. Two or three such transplantings should be enough.

Pinching

During the growing season pinching off growing tips should not be neglected—otherwise, whether seedlings or old dwarfs, the trees will be unsightly in form and disproportionately long branches will be produced. Generally, pinching is practiced and begins when young shoots are an inch or so long. Only one or two leaves are allowed to remain on any one branch. In the case of conifers such as spruces and pines, pinching should be done as the soft new branches elongate and begin to show their new needles. Every new twig should be pinched back, except the ones desired to improve form or to fill a gap; only a bit of elongated

shoot should remain, from which the new buds are formed. Unsightly or deformed dwarfed potted trees, often seen at the novice's home, are in most cases the result of wrong pinching or neglect of pinching.

Densely twigged trees such as elm, maple, Pomegranate and zelkova, should be pinched during the growing season whenever the twigs attain one or two inches in length. Always remember to retain one or two leaves on each branch.

The flowering shrubs such as azalea, enkianthus, rose, quince and jasmine, or fringe-tree and crabapple, contrary to the preceding, should not be pinched even lightly. Pinching back of these varieties removes the flower buds and prevents flowering.

The weeping willow and tamarix trained in weeping form are better if all the new twigs are cut off in the middle of spring. When new growth starts again, the weeping branchlets that are produced will be more slender and delicate.

Varieties

Now, I feel it is better to select a few trees which would probably be of interest to readers and try to describe in a few words the essential points on their culture.

Flowering Cherries. Japanese flowering cherries are nicer as garden trees but sometimes well known garden varieties are attractive as dwarfed potted trees. In dwarfing these trees, the general practice is no pinching or pruning. Among the flowering cherries, the best is *Prunus incisa* and its varieties. This densely-twigged, dwarf shrub is very lovely with little single blooms. *Prunus kurilensis* is good, too. Over-watering may kill the whole plant or destroy most of the branches.

Wisterias. If old living stumps are cut off one or two feet from the ground, and all the big roots are also cut off close to the stump, the stump can be trans-

This cherry tree was a sapling a century ago

1800 1950

This Bonsai pear is 150 years old

planted into a pot or bed—where it quickly becomes established. When its new life has started scions of garden varieties suitable for dwarfing are grafted on the upper portion. In a few years beautiful flowering potted trees are formed. White and purple Kabitans and pink wisteria rarely have their flower buds damaged by frost. Ebicha and Issai are floriferous and more dwarf in growth. I raised by layering, some years ago, the two plants in the photograph. The variety is Issai, one of the most popular wisterias in Japan, as it blooms heavily every year, even when young and in pots. By repeated cutting back to the two lowest buds of each shoot, for several years, and by cutting back the strong roots each time, nice dwarfed potted trees are obtained which gradually lose their vine-like habit. In the course of these years, some spurs and small buds are produced. To encourage these spurs to form flower buds in a season or two, repeated pinching should be practiced during the summer growing season, and by keeping drier in summer, floriferous dwarfed wisterias will develop (as seen in the photograph). At the end of the growing season, or in winter, all shoots are cut off—only a few promising buds remain for next year's bloom. Some Japanese connoisseurs will tell you that these are only "dwarfed potted trees," but *not* Bonsai, and will comment that these wisterias lack in dignity, artistic form, taste, natural vividness, age and so on. These criteria may be the essential elements of Bonsai in general, but there is a wide range of rank among Bonsai. Considering that most of the Bonsai are being improved throughout their lives (even many dignified, renowned old trees are kept wired in some branches) I believe my wisterias at least deserve to be called the "Children of Bonsai." I feel I owe them a deep apology because I have grown them in cheap unglazed pots instead of artistic containers.

Flowering Crabapples. Among these the most popular is Hall's Crabapple, known for nearly ninety years in American gardens. The tree is easily trained to one or two feet in height by bending or coiling the long shoots. So trained, these produce many flowering spurs and become very floriferous. Every spring the trees are a beautiful sight with their lovely rose-colored blooms hanging gracefully on long, slender, reddish flower stalks.

Fanciers love the aged trees of *Malus baccata* var. *hondoensis* with copious small bright fruits, *Malus prunifolia* and its varieties with yellow or red fruits, and *Malus sieboldi*, all of them known in American gardens for many years. If bushy growth is desired, all or nearly all the leaves on the current growth should be picked off in early summer; subsequently every axillary bud comes into growth. In the autumn the sprouted twigs are shortened to two or three buds.

Peaches and Pears. Though rarely seen as dwarfed potted trees they make lovely ones. These and the preceding are, with a few exceptions, called by the "dignified" connoisseurs merely "potted flowering trees."

Birches. By planting several very young seedlings a few inches high in a shallow container the shape of a rectangle or an ellipse (with a depth of two inches or more, and about one by two feet, or less) the beautiful scenes of a birch community are easily achieved in less than ten years. Every birch that attains one to two feet in height is limited and kept to that height easily, and needs only pinching to regulate growth. The dwarfed trees possess the fine slender white-barked trunks, with handsome foliage. I highly recommend that you try birch. Place the container, in summer, into another larger and shallower basin filled with water and carry it to your room. It will be cheerful to both the birches and yourself.

Beeches, Elms and Zelkova. Raising these densely twigged trees from seed-

Author photo

A miniature forest of dwarfed Yeddo Spruce (*Picea jezoensis*)

lings is fascinating, but requires patience. In the spring their tender young foliage is a delicate green. They are refreshing in form and color in summer, clear yellow in fall, and in winter they have, above all, the enchanting form of pigmy giants. Their aged and exposed roots enhance and express the vividness of "giants" seen in nature. Unless they are pinched back very often during the growing season the trees are not well formed. Besides the pinching, it is advisable to cut off the leaves in early summer to hasten the development of denser twigs. Repotting should be done every other year. Some of the soil attached to the roots is shaken off and the roots thus exposed cut off. The new soil should have fertilizer but less sand than the usual potting mixture to prevent the dying off of twigs.

Maples. A tremendous number of various garden varieties of Japanese maple are propagated by inarching, trained as dwarfed trees, and sold annually. Few plants are more refreshing than these maples in the hot Japanese summer. On verandas, in windows, in the alcove when guests are expected, on the office desk, in refreshment rooms, and by the side of lecturers, you will find the graceful foliage of these handsome miniature trees. If you like fall color and live where trees do not ordinarily display it, pick off all the leaves in early summer and you can be sure that the second growth of leaves will soon appear, and produce gorgeous colors. Repeated pinching is most needed.

Rhododendrons and Azaleas. One of the most popular dwarfed potted trees is the azalea. Among these, Satsuki and Kurume azaleas are extensively grown and enjoyed. There are hundreds of desirable varieties. Aya-no-Kanmuri, the Kurume azalea shown in the accompanying illustration, is an old, well-formed specimen, smothered with fine blooms. This was raised from a cutting and trained by Mr. K. Akashi, the notable hybridist and grower of Kurume City. As the flowers fade, or earlier, undesir-

A 300-year-old specimen of Azalea variety Yokihi

able twigs should be cut off or shortened. In the latter case the new growth, if crowded, should be thinned. Young plants should be repotted once a year, but every two or three years is sufficient as they grow older. Nowadays, I regret to say, there is a fever for overwiring to hasten the production of dwarfed trees —and thus to fill the gap caused by the loss of old trees during the war. This is especially true for Satsuki azaleas, which are in fashion. To me, the resulting plants look as if they had been seized by wires. They are only artificially picturesque and old-looking.

Many nice naturally dwarfed rhododendrons are found and dug out annually. When well settled in containers they are very lovely, though not comparable in gorgeousness and size of bloom to the modern hybrids. *Rhododendron obtusum* and *Rhododendron kiusianum* from which Kurume azaleas were derived, are desirable ones to grow as dwarfed potted trees.

Pines. Pines, the inhabitants of the poor, dry, sandy soils, become weakened or die off if the drainage is poor in the containers. But as pines are vigorous in their nature, the repotting is only necessary once in every three or four years. With deciduous trees it is generally better to repot each year. In either case, the best season for repotting is in the spring. If the pine tree is removed from the container, with its ball of soil, very long roots will be seen on the underside; these must be shortened rather severely. Some soil should be removed from all faces of the ball, and the exposed root and rootlets cut off. In repotting, put coarse sand sparingly on the bottom of the same container; place the pine on the sand and fill the container with new soil to take the place of the old. Press the soil firmly—the firmer the better in pine planting. For dwarfer and denser growth, the pinching, as previously referred to, must not be neglected. As the

Ann Hume Photo

Mountain slopes where soil is poor and thin frequently produce crooked picturesque trees like this—the inspiration of Bonsai

tree becomes older the pinching should be lighter. The thickly cork-barked Black Pines are much admired for their trunks; the bark is thicker than the trunk itself. Japanese Red Pines are not much appreciated, but their slender trunks with impressive reddish bark are very ornamental—whether planted singly or several trees together in a container. It is more difficult for the average fancier to keep the branches and twigs of Red Pine healthy. The Japanese White Pines (*Pinus parviflora* and *Pinus pentaphylla*) are extensively grown and dwarfed, though there are also many naturally dwarfed, aged trees of the two latter species.

Japanese Flowering Apricots. If you are in Japan in the midst of winter, you will see Japanese homes replete with flowering apricots or Mume in dwarfed potted forms. There are numerous named varieties, single flowered or semi-double, upright and weeping. These dwarfed potted Mumes bring life-long joy with their delightful and very sweet fragrant blooms in late winter and early spring. Just after the blooms have faded, every shoot or twig that bloomed should be shortened to the lowest one or two buds, from which new growth soon comes to replace the twigs that were removed.

Bamboo. The bamboos are dwarfed by peeling off the sheath, one a day, while the shoots are very young. The dwarfed potted bamboos are very decorative indoors and out.

Within the limits of a brief article I have tried to give readers of PLANTS & GARDENS some idea of Bonsai. I hope it is not too vague to be helpful to those who might like to grow dwarfed potted trees.

GARDENS OF VICTORIA, BRITISH COLUMBIA

Distinctive year-round beauty

W. H. Warren

THERE is a quality about the gardens of Victoria, British Columbia, that catches the eye of many visitors. This is not surprising, for Victoria is known as the City of Gardens. Its famous Butchart's Gardens, colorful flower gardens, public Rose gardens, and in particular its annual Spring Garden Festival featuring the opening to the public of many of its finest private gardens, are well-known features of the City.

There are several factors that contribute to the character of these gardens. Victoria is favored by climatic conditions (in common with the coastal parts of Oregon, Washington, and southern British Columbia) that are conducive to good gardening and the use of a wide range of plant material surpassed by few parts of the world. The period of bloom for plants of a given

British Columbia Government Travel Bureau photos

Garden in a natural setting

species and the length and continuity of the flowering season throughout the year are surpassed by few places in the world; parts of New Zealand are probably the only exception.

Because of Victoria's proximity to the international border, and its predominately English background, its gardens reflect the best features of both British and American traditions. From Britain comes a natural love of gardening and flowers in particular. The English perennial borders of Victoria, and its rock-studded sea-side rock and alpine gardens are a joy to behold.

Gardening is a genuine interest of most of the people of Victoria. Homeowners who are not only amateur gardeners, but genuine plantsmen, exhibit a skillful blending of a wide range of plant material. This material includes not only the usual run of evergreens (chiefly conifers, in limited range of variety, size, shape, and color—whose use has been so greatly overdone), but herbaceous flowers, and many fine dwarf trees and shrubs—both deciduous and evergreen. This is one of the features that attracts many Americans each year to the Spring Garden Festival in Victoria.

It is somewhat difficult to indicate the general character of these gardens in a single paragraph, but there is no real off season in those that attract the most ad-

A rock garden successfully planned to blend with lawn area

Rock Garden—pools and plantings interspersed

Border of lavender defines sunken garden below terrace

miration. If Nature has produced an undulating, rocky homesite, the gardens usually carry on from where Nature left off, supplementing the natural beauty rather than replacing it with something else. Rockeries may have their alpine plants, but there is usually a basic planting of dwarf evergreens, Cotoneasters, Daphnes, Heathers, and other dwarf shrubs.

The value of dwarf evergreens, and true dwarf conifers in particular, for rocky sites, is not generally appreciated. Their annual growth is so slow that once a site is designed and planted, its appearance can be depended upon to be preserved for many years in much of its original form. For general garden use, plants attractive in flower, fruit, and foliage are preferred, with flowering evergreens being given high priority. Those that are attractive throughout the winter months are also desired. The Cotoneasters and Firethorns (*Pyracantha*), Skimmias, and Aucubas, with their colorful fruit, are given special consideration, all doing particularly well in the Northwest. It can generally be said that the gardens that are designed to be attractive through the winter months are also attractive the rest of the year. Heathers are widely used, in a range of species and varieties that bloom throughout the year. Particular interest is shown in the winter-blooming Heaths, such as *Erica carnea* and its varieties, and the many hybrids of *Erica mediterranea*.

In the Spring the Rhododendrons, Azaleas, Flowering Cherries, Hawthorns, Crab Apples, and Japanese Apricot (*Prunus Mume*) hold sway with Forget-me-nots (*Myosotis*), spring bulbs, Wallflowers, and Polyanthas, and to a lesser extent Pansies and hardy Stocks. These are at their peak during the Spring Garden Festival the first week in May. Lavender, Roses, Sweet Peas, and all the fragrant flowers and herbs for which England is noted, are at their peak in late June.

Through careful basal planting around the house, these trees, shrubs, and flowers blend the house and the garden into one harmonious unit. Harmony and design in the gardens may not always be up to the standard of the professional landscape man, but the material used reflects to a large degree the character and preference of the owners.

WILD FLOWER PRESERVES

Policies underlying their management

Frederick Houghton

IN the valley of Cattaraugus Creek in western New York there are three preserves for wild plants, each managed on the basis of a different policy.

The Houghton Preserve

The Nature Sanctuary Society of Western New York[1] owns 23 acres of land in Erie County, New York, maintained as a preserve, officially named the Houghton Preserve. A portion of this land, about 15 acres, is a typical Sphagnum bog, which supports an almost complete bog society of plants. Small Cranberries and other heaths cover much of the moss, and form a level moor on which the insectivorous plants abound. Pushing through the heaths are hundreds of lovely wild Orchids, and balls of white fluff are held aloft by the stiff stems of Cotton-grass.

The moor is bordered on two sides by a band of tall shrubs.[2] On the west side the surface is sufficiently above the water table to support a typical swamp forest made up of large specimens of Maple, White Ash, American Elm, and Black Cherry. Beneath these there are sprawling mats of Wintergreen (also Goldthread, or *Coptis trifolia,* and Clintonia), and a thick growth of moss. A fine stand of White Pines shuts off the bog on the south side.

The policy of the Society is to keep this Preserve in its present state as a typical Sphagnum bog with its accompanying swamp forest, showing the unique assemblage of plants of these two societies. It is comparatively easy to do this. The acid condition of the bog is conducive to the growth of that particular type of vegetation, but is inimical to the growth of other types, so that there is little danger of invasion by undesirable weeds.

There are, however, two difficulties. The shrub Leather-leaf spreads so rapidly on the moss that it has already dominated a large part of the moor, and there is danger that eventually it will cover the entire bog. Although it is troublesome, it is not compact enough to shade the surface beneath it, and so most of the bog plants grow through it.

A more serious invasion is threatened by the White Pines which border the moor. The prevailing winds carry their seeds into the bog; and though conditions

[1] With headquarters in the Buffalo Museum of Science, with which it is affiliated. The Society publishes a monthly magazine devoted to news about local and other sanctuaries.

[2] Plants of the bog include:

- Small Cranberry (*Vaccinium Oxycoccus*)
- Other heaths:
  - Pale Laurel, or Bog Laurel (*Kalmia polifolia*)
  - Leather-leaf (*Chamaedaphne calyculata*)
- Insectivorous plants:
  - Pitcher-plant (*Sarracenia purpurea*)
  - Sundew (*Drosera rotundifolia*)
- Orchids
  - White Fringed Orchid (*Habenaria blephariglottis*)
  - Small pink Orchids (*Arethusa bulbosa*)
- Grass-pink (*Calopogon pulchellus*)
- Rose Pogonia (*Pogonia ophioglossoides*)
- Cotton-grass (*Eriophorum callitrix*)
- Gentian Family
  - Buckbean (*Menyanthes trifoliata*)
  - *Bartonia virginica*
- Border shrubs
  - Black Chokeberry (*Aronia melanocarpa*)
  - Mountain-holly (*Nemopanthus mucronata*)

Author photos

Pitcher plant (*Sarracenia purpurea*)

there are not ideal for them, a great many seedlings get a start. Most of these die before they make much growth, but a few attain a height of 10 feet or more. Because the roots of these trees can seldom reach firm mineral soil, strong winds turn them over, and their rotting trunks furnish a foothold for other plants seeded from the swamp forest. Members of the Society appreciate this danger, and have cut many of these young invaders and dragged them off the bog. Without this constant care, there is little doubt that the bog will eventually become a swamp forest.

The Peak

West of this Preserve, on a plateau which overlooks the scenic Zoar Valley, is a privately owned preserve known as The Peak, which comprises about 12 acres of land. Its soil varies; part of it consists of sand and gravel, and part of blue clay. A strong brook in a gully provides an ample supply of water. This gully declines from east to west, and so one side is open to the sun, while the other side is in shade; this permits the growth of both "sun-loving" and "shade-loving" vegetation. Four acres are covered by 3,000 Red Pines, which are now 20 feet high; and four other acres are in woods of the Maple-Beech-Hemlock association. This woodland seems to be a remnant of the original forest, many trees being over a century old; and beneath them are all the plants which belong to that association.

The policy of the owner of this Preserve is to make it a wild flower museum—not only to conserve the plants already there, but to bring to it and colo-

White Fringed Orchid (*Habenaria blephariglottis*)

nize as many as possible of the native plants lacking there, and also plants native to other areas which might be desirable. He has brought uncommon plants from the limestone ledges,[3] and from the sandstones and conglomerates of the high hills.[4] Special soil conditions had to be prepared for these plants in the neutral soil of the Preserve. Most of these collected plants have survived; some have persisted and spread; but a few, like Trailing Arbutus (*Epigaea repens*) have failed completely.

[3] Hart's-tongue Fern (*Phyllitis Scolopendrium*), Ebony Spleenwort (*Asplenium platyneuron*), Shrubby Cinquefoil (*Potentilla fruticosa*), *Hypericum Kalmianum*, Creeping Juniper (*Juniperus horizontalis*), and Walking Fern (*Camptosorus rhizophyllus*).

[4] The tiny Orchid, *Malaxis* (*Microstylis*) *unifolia*, the lovely Bluets (*Houstonia caerulea*), Pale Corydalis (*Corydalis sempervirens*), Black Cohosh or Bugbane (*Cimicifuga racemosa*), and many others.

The William Prindle Alexander Preserve

The Nature Sanctuary Society of Western New York owns also the William Prindle Alexander Preserve. It consists of about 113 acres, all on a steep hill which rises abruptly from the floor of Zoar Valley. Cattaraugus Creek makes a loop around three sides of the hill; and on the fourth side is a narrow deep valley which was, in very ancient times, the course of the creek. This is now occupied by a strong brook.

The entire hill has been grazed over for a century, and nearly all of its original vegetation has been destroyed; but on the summit there still remains a grove of huge Maples, evidently a century old. Originally the hill was covered by a Maple-Beech-Hemlock forest.[5]

The policy of the Society has been to allow this hill to revert to its original state, without interference, in the orderly natural succession of vegetation, which begins with bare soil and culminates in a woodland of the Maple-Beech-Hemlock association. This presents difficult problems.

Since the Society acquired this Preserve, no grazing has been allowed on it; as a consequence most of it is now covered by a dense growth of Goldenrod, Bracken, Sumac, and Bird Cherry; the most pernicious weeds are Thorn and Blackberry, which give the hill the appearance of an abandoned farm. To allow it to revert to its original woodland, young trees must be given favorable conditions for growth. But tree seedlings must have sunlight, and the present vegetation shades the soil sufficiently to prevent or retard their growth. To provide

[5] Under the direction of the Curator, Mr. Alick Carter, members have identified and marked permanently all the species of trees on the Preserve. A member, Miss Wickes, has identified and listed 218 species of plants on the two Preserves; and a similar list has been made of the birds.

Stream and mixed forest in the Alexander Preserve

Left to Right:
Walking Fern, Ebony Spleenwort and Hart's Tongue Fern

the necessary sunlight for the tree seedlings, the weeds must be removed by cutting, grazing, or plowing under; unless this be done, the present conditions on the hill must continue for a long time. (A similar hill cleared and grazed over fifty years ago is still covered by Bracken and Sumac, amongst which a few young trees have become established.) But on a preserve as large as this the work of preparing the land for natural reforestation seems too expensive for the Society to undertake.

Several procedures have been suggested. Members have already planted Pines in open spaces, and these have become established. Planting on a small scale in such open spaces might partly reforest the hill in a few years. A few ounces of seeds of Maple, Ash, Hemlock, and Black Cherry scattered in a high wind in early spring, might result in producing, under natural conditions, young seedlings sturdy enough to hold their own against encroaching weeds. Four-foot Maple seedlings transplanted over small areas would probably succeed. If the Society allowed a farmer to graze cattle on the hill for two years, the hill might be cleared enough to allow seedlings to establish themselves.

These Preserves illustrate rather well three types of wild flower preserve. In one type, the policy is to keep the preserve in its present condition by conserving its present vegetation and eliminating any plants which might change it. In another, the policy is to create a museum of living plants, or a botanic garden, in which plants of particular species or native to particular regions can be shown. In the third, the policy is to allow the preserve to revert to its original state by natural processes. Most wild flower preserves are of one or another of these three types.

Author photos

A. E. Curtis, breeder of poppies

THE ORIENTAL POPPY

. . . a dependable perennial

A. E. Curtis

THE ORIENTAL poppy is one of the hardiest of our perennials when growing in a location that is well drained. Unfortunately many gardeners consider it difficult to grow, yet plants as much as twenty years old may still produce a colorful display each spring. Probably the difficulties encountered by some gardeners are due to spring planting, the use of pot-grown plants with stunted roots, or planting in a poorly drained location.

Planting Time

The best time to put in Oriental poppies is during August when the plants are dormant, but they may be moved during the September and October growing season just as successfully, except in the far North. Nurserymen often send out plants during the latter period because some gardeners have confused dormant plants with dead ones. With the dormant plants, over-watering may cause rot. Only enough water is needed to settle the earth about the roots, and in planting, the dormant roots should be set upright with about three inches of soil over the crown. This protection to the crown is important in preventing heaving in winter, in supporting the heavy flower stalks, and in discouraging crown rot, which probably is the only disease now attacking the Oriental poppy.

Oriental poppy showing two-year-old root system

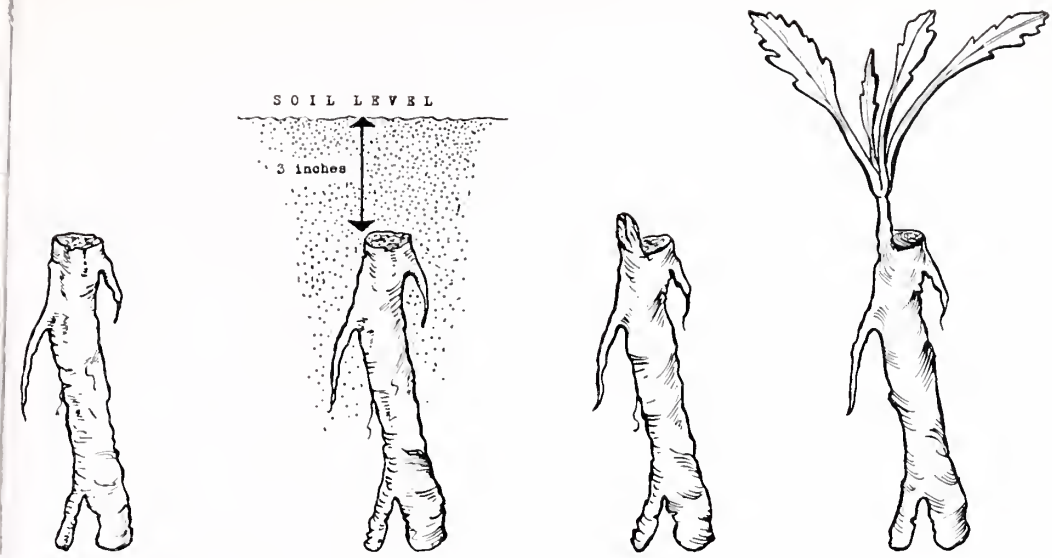
Tips on Culture

After the blossoms have faded it is important to cut the flower stems, leaving stubs of an inch or two. In this way seed formation is prevented and the orange-red seedlings, which may crowd out the parent plant, are avoided. Also, the short stubs may protect the crown until the fall growth starts. If a poppy plant fails to appear in the spring it is not correct to assume that it is dead, for after a year's disappearance the plant may return with renewed vigor. Often times an old root is infected with crown-rot near the surface and the plant needs time to send up new shoots from deeper, healthier roots.

In dividing or propagating poppies it is best to use large divisions, or long pieces of root. These should be planted upright, making sure the upper end of the root-cutting is about three inches below the surface. A cutting six to eight inches in length should produce blossoms the following spring. A light mulch of straw, salt-hay, or other material is helpful in the prevention of winter heaving the first year.

Many gardeners do not realize that the Oriental poppy can be a wonderful cut flower. For best results, after cutting the flowers, the cut stem ends should be placed in the flame of a gas burner or over the coil of an electric range until they glow like a coal and become heavily charred. A candle flame may be used. Then they should be placed in cold water. It seems that the heavy burning allows the blossoms to absorb water and prevents the milky juice from sealing the

Dormant root system showing where to take cutting



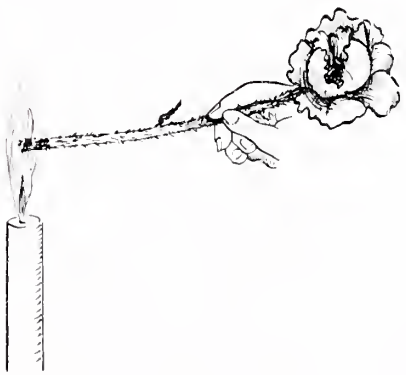
ENLARGEMENT OF ROOT CUTTING

POSITION OF CUTTING IN THE SOIL

YOUNG SHOOT BEGINNING AT THE UPPER END

NEW PLANT FROM SHOOT WELL STARTED

pores. The petals become practically wilt-proof and last until they drop off with age.



Varieties

Many horticultural forms of Oriental poppy are hybrids of *Papaver orientale* and *P. bracteatum*. In these named varieties there is great variation in vigor and in their susceptibility to rotting in soil that is too damp, but if they are ideally situated Oriental poppies will bloom for many years and show no signs of deterioration. After breeding Oriental poppies for twenty years and placing special emphasis on hardiness, large flowers, and new colors, I can recommend the following varieties; all have proven hardy in my garden in Cincinnati.

For reference convenience, I have placed them in color groups:

Deep red. Arthur Curtis, Australia, Mahony Ameliore, Red Crinkles, Toreador, Lulu A. Neeley. All of these varieties are early flowering and Mahony Ameliore will do well in partial shade if it has no competition with tree roots. In such a location it will bloom at least a week later than in full sun.

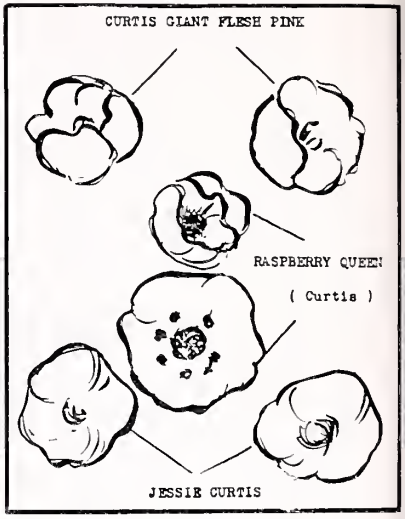
Medium red. Buckeye Red, Cavalier, Wurtembergia. All are extra large, midseason blooming.

Watermelon reds and pinks. May Curtis, Dorothy S. Rowe and Rose Glow are in the midseason group. Glowing Rose is very early and G. I. Joe is very late in flowering. While these are brilliant, they do not clash with other colors and are, for that reason, the first choice of the majority of visitors to my garden.

Deep salmon pink. Mary Jane Miller and Curtis Giant Salmon Pink are large early flowering varieties; Lach's Koenigen is large and late flowering.

Medium pink. There are probably a hundred named poppies in this color class

Identification chart of poppies in photograph at left



described as salmon pink, salmon rose, coral pink and La France pink. For some reason the poppy named Mrs. Perry is the general favorite, but I know there are at least a dozen different poppies on the market with this name. All are better than the plant I saw many years ago which was imported from the originators. Here are listed five distinct poppies in the color class: Helen Elizabeth, New Perfection, Watteau, Ridgewood Beauty and Perfection. These are midseason, free-blooming varieties. Watteau is the nearest to a dwarf of any poppy. Perfection blooms slightly later, is larger and is paler salmon. Ridgewood Beauty has, in my estimation, the finest form of all poppies. The deeply fluted and ruffled petals are so wide that they completely overlap, forming a double row. The flower is cup-shaped. Sweetheart is a new variety of purest pink.

Light pink. Spring Morn is a large flowered variety which blooms very early. Dainty Lady and Sass Pink are medium sized and bloom in midseason, and Cheerio is later flowering. While Cheerio is the same color as Sass Pink, a red blotch in the center seems to intensify the color; it is a favorite of almost everyone who has seen it. A number of poppies of pastel tints are beautiful as cut flowers but are subject to fading in bright sunlight and are of little garden value. Enchantress, a soft lilac rose is extra large and has tall, heavy stems.

Burgundy, Mahogany. Henri Cayeux, Indian Chief and Jessie Curtis range in color from burgundy to mahogany. All are medium in size and bloom early to midseason. Raspberry Queen is a very large poppy, crushed raspberry in color.

Yellow. The so-called yellow Oriental poppies are still mostly orange in color and as they burn in the sun I do not feel they are worth while. Ophir Gold and North Dakota are the best varieties now available.

Stoloniferous in Habit

The double poppies listed with the Orientals have other strains in them. They all send out underground runners, and may be transplanted at any time. There is no danger of losing them, but they need careful watching, as they spread rapidly and will occupy the whole flower bed unless controlled. They bloom a week earlier than the true Oriental. Olympia, Salmon Glow and Crimson Pompom are the popular varieties.

LILIES FOR COLD CLIMATES

Species and hybrids

Isabella Preston

THE meaning of the term "cold," as applied to climate, is different to a man in New York from what it is to one in the Great Plains region of the United States or the Prairie Provinces of Canada. At Ottawa, where I lived for many years and grew Lilies, the winters are not so severe as on the Prairies, but are colder than in this part of Ontario which is near Toronto. Another important point, besides temperature, is the snowfall. If the snow comes early, is plentiful, and stays on the ground all winter, bulbs and other perennial plants do not need any protection in the way of mulching except in the very cold districts; there a foot or more of peat-moss, strawy manure, or other coarse material is sometimes used. In districts where the snowfall is light and thaws are frequent during the winter, the ground should be mulched as soon as the soil is frozen, in order to keep it frozen when a mild spell of weather comes. It is the alternation of freezing and thawing that does most harm to plants. In wind-swept areas, evergreen boughs, corn stalks, or other suitable material can be used to hold the snow.

The kind of soil is not considered of first importance in growing Lilies, but the soil must be well drained. Leaf mold is recommended for improving the texture of both light and heavy soils; if manure is used it must be old and well rotted, because, like all bulbs, Lilies "dislike" fresh manure.

There are several species of Lilies which do well in cold districts, in addition to the hybrids which have been bred in Canada. Unfortunately there are no white-flowering Lilies which can be recommended for very cold districts. The Regal Lily (*Lilium regale*), George (C.) Creelman (a horticultural variety of the hybrid *Lilium princeps*), the Madonna Lily (*Lilium candidum*), and the white variety of the Turks-cap Lily (*Lilium Martagon* var. *album*) did well at Ottawa; but it is seldom that they survive the severe winters of the Prairies.

The cold-tolerant Lilies in the following lists are arranged in alphabetical order.

Species

Lilium amabile has grenadine red flowers with dark spots which vary a great deal on different plants. There is a yellow-flowering variety which is very attractive. The plants are sturdy, and have broader leaves than many Lilies.

The Caucasian Lily (*Lilium monadelphum*) should be tried, as it is one of the earliest to bloom. The flowers are bell-shaped, with reflexed tips, pale lemon-yellow with a few small spots. *Lilium Szovitsianum* is very similar. Both "like" a fairly heavy soil with some lime in it.

Coral Lily (*Lilium pumilum*, or *tenuifolium*). The common name describes this flower fairly well, although the color is more like scarlet sealing wax than coral. It is one of the easiest Lilies to grow from seed, and a few seedlings should be grown each year, because, in some places, the bulbs are not long-lived.

Lilium Davidii and its varieties are easily grown in the ordinary garden, and soon make fine clumps. They propagate very easily from the bulblets which form on the creeping underground stem.

Lilium Duchartrei is reported (by Mr. F. L. Skinner of Dropmore, Manitoba) to be fairly hardy. Its nodding flowers have reflexed segments which are marble-white, more or less covered with wine-

McFarland photo

Tiger Lily (*Lilium tigrinum*)

purple spots. It forms bulblets on the creeping underground stem.

Lilium Henryi, with orange-yellow flowers, is one of the earliest Lilies to show above ground in the spring; but it does not bloom until August. It "likes" a fairly rich soil.

Madonna Lily (*Lilium candidum*). This beautiful Lily is not always easy to grow, but is worth a little trouble. The bulbs must be planted in early September in a place where they will be sheltered from the cold winds of spring.

Orange Lily (*Lilium bulbiferum* var. *croceum*). This is one of several upright-flowering Lilies which are hard to classify. Most of them do well in ordinary garden soil.

The Regal Lily (*Lilium regale*) is the well-known white trumpet Lily with pink flushes on the outside of the flower. It is not hardy enough for the really cold districts, but it sometimes lives over the winter and blooms for a year or two. The bulbs should be planted about 8 inches deep in well-drained soil, and surrounded with sand. The young growth should be sheltered from cold winds in the spring.

Star Lily (*Lilium concolor*). The variety Dropmore is the hardiest form of this dainty upright-flowering Lily with brilliant scarlet flowers.

The Tiger Lily (*Lilium tigrinum*) is well known. It seems to thrive even in the coldest districts.

The Wood Lily (*Lilium philadelphicum*) is native in Canada from Ontario to the Rocky Mountains; and from East to West in the United States. It is difficult to grow in town gardens; but in the districts where it is native it can be successfully transplanted into gardens.

Hybrids

The Maxwill Lily, raised by Mr. Skinner, is a handsome plant of the *Lilium Davidii* type. It can be recommended for any district where plants are grown. It blooms in July.

Author photo

Lily Spitfire, a seedling of Edna Kean

The *Lilium philadelphicum-dauricum* hybrids were raised by Mr. Skinner. Several have been named, and all have upright flowers. Azalea has clusters of bright apricot flowers. Glow has open, cup-shaped, reddish orange blossoms. Philada is one of the earliest Lilies to open.

Lilium Scottiae, raised by Mr. Skinner, has flowers which face outward and are salmon-orange in color, with a few dark spots. It blooms in June and July.

"Stenographer group" is the name given to a group of Lilies from a cross made in 1929 at the Central Experimental Farm, Ottawa. Seven were named, have been grown successfully in many parts of the world, and are doing very well on the Canadian Prairies. They are

all interesting plants, but the following four are quite distinct.

Brenda Watts has orange-red flowers arranged around sturdy stems; they face outward, and the tips of the segments are reflexed.

Edna Kean has greenish brown stems and dark green leaves. The flowers are rich dark red.

Muriel Condie has a very symmetrical cluster of golden orange flowers, which face outward.

Phyllis Cox has the same habit as Muriel Condie, but the flowers are brilliant orange-red in color, deepening towards the tips; the outside is golden orange.

Coronation is a seedling of one of the Stenographer Group. The drooping yellow flowers are faintly spotted with brown. This variety is not so strong-growing as the others, but is quite hardy. The color of the flowers is unusual among Lilies that bloom in June and July.

Hurricane and Spitfire are seedlings of Edna Kean. They are similar in habit; when these plants were raised, their particular habit was quite distinct from that of any other Lily. The medium-sized flowers are open vase-shaped and face upward. In Hurricane the flowers are rich dark red; in Spitfire, flame-scarlet.

Those who live in cold climates need not be deterred from raising Lilies, if they plant the kinds that have proved to be hardy.

THE REGAL LILY IN ITS HOME

". . . in narrow, semi-arid valleys, down which thunder torrents, and encompassed by mountains composed of mud-shales and granites, whose peaks are clothed with snow eternal, the Regal Lily has its home. In summer the heat is terrific, in winter the cold is intense, and at all seasons these valleys are subject to sudden and violent windstorms against which neither man nor beast can make headway. There, in June, by the wayside, in rock-crevices by the torrent's edge, and high up on the mountainside and precipice this Lily in full bloom greets the weary wayfarer. Not in twos and threes but in hundreds, in thousands, aye, in tens of thousands. Its slender stems, each from 2 to 4 feet tall, flexible and tense as steel, overtopping the coarse grass and scrub and crowned with one to several large funnel-shaped flowers more or less wine-coloured without, pure white and lustrous on the face, clear canary-yellow within the tube and each stamen filament tipped with a golden anther. The air in the cool of the morning and in the evening is laden with delicious perfume exhaled from each bloom. For a brief season this lonely, semi-desert region is transformed by this Lily into a veritable fairyland."

E. H. Wilson, in *Lilies of Eastern Asia.*

Garden border along a wall, natural woods in background →

The color print of "Bikan" Tree Peony on color page 2 is printed by courtesy of *House & Garden.*
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The Japanese Tree Peony, BIKAN—meaning "Beautiful Spectacle"

The European Tree Peony, REINE ELIZABETH

A *lutea* hybrid Tree Peony, SOUVENIR de MAXIME CORNU

The hybrid Lily, T. A. HAVEMEYER, a cross between *Lilium myriophyllum* var. *superbum* and *Lilium henryi*. First exhibited in 1937 by the Royal Horticultural Society where it received The Award of Merit. It is still one of the finer Lilies.

Oriental Poppy, MANDARIN

TREE PEONIES

". . . king of the flowers"

Louis Smirnow

THE ANCIENT Chinese called the tree peony the king of flowers. It was revered by all, although only the aristocracy could afford to own the plants because of the tremendous prices commanded in the market. More primitive and pre-dating the herbaceous types, the tree peony was imported into Japan from China at an early date. Europe received the plant from the Orient about 150 years ago.

The tree peony is a shrubby counterpart of the familiar herbaceous perennial and is distinguished principally by its woody stems. The branches do not die back to the ground in winter as do the herbaceous types. It puts forth its buds in the fall, and thus develops somewhat faster in the spring; by the time it is several years old it is capable of blooming in great profusion. Tree peonies usually are taller than the herbaceous kinds and have larger flowers—which are produced two or three weeks earlier. The plant may grow to a height of four to five feet and may become three to four feet in diameter. Renkaku, a white variety, has been known to grow as high as five feet with a six foot spread, but this is somewhat unusual unless the plant is very old. Some attain an age of sixty or eighty years.

A tree peony is a striking plant and should be given a place of honor. So placed, a single specimen may become the focal point in an intimate garden. A group of them is spectacular and when backed by lilacs is unbelievably beautiful.

Types

At the present time three distinct groups of tree peonies can be distinguished: the European, the Japanese and the lutea hybrids. Though the European and the Japanese types are from the same ancestry (*Paeonia suffruticosa*) they are quite different in appearance. The European tree peonies are usually very double and have broad foliage; the Japanese types have single or semi-double blooms and the leaves are much finer and thinner than the European. Also, the Japanese tree peonies usually are centered with a beautiful cushion or circle of yellow stamens. The lutea hybrids are the product of crossing *Paeonia lutea* with *P. suffruticosa;* these are difficult to propagate and are very rare.

The colors of both the European and the Japanese tree peonies range from pure white through pale pink, rose, salmon and cerise to deepest red. The Japanese have a much broader color range than the European types. Lutea hybrids display colors and shades all their own; yellows ranging from clear tones to orange tints vie with combinations of yellow and red for the viewer's attention. Some of these are unsurpassed even by the rose. In the Japanese tree peonies there are clear whites, pinks, salmons, reds and maroons that cannot be described in words though their Japanese names may come close to it, as does Hino-tsukasa, which translates to "ashes of the setting sun." The refreshing daintiness of the semi-doubles and the airiness and sparkle of the full double blooms of any of the tree peonies defy description.

Culture

Tree peonies begin to flower in the New York area about May 15th to 20th. The lutea hybrids open latest, about May 20th or 30th. Some varieties lend themselves to forcing, but all are easy to grow in most parts of the country. They have been known to survive winter tempera-

McFarland photo

A tree peony plant in full bloom

tures of twenty to thirty degrees below zero and will endure more neglect the year round than most plants.

Though it is almost impossible to kill a tree peony with neglect, a little attention produces better flowers and a more handsome shrub. Well drained soil and sunlight for the greater part of the day are the major requirements. If the plants are set rather deeply into the ground the production of new sprouts or shoots from the roots will be induced and a larger shrub will result. The tree peonies need at least four-foot spacing since the mature specimens are that high and as wide. Bone meal or a commercial fertilizer low in nitrogen but high in phosphoric acid and potash is the best to use. Manure should be avoided on any peony. Bone meal is sufficient, and no other fertilizers need be applied.

Protection

Since the plants are hardy, they need but little winter protection after the first year. Young plants, however, should be covered with leaves or some such mulching material. In severe winters an occasional limb may be killed by extremely cold winds, but this does not affect the rest of the plant. The dead wood can be cut off in the spring.

Diseases *

The tree peonies are relatively free from disease though they are sometimes threatened with Botrytis blight. If a

* *Cladosporium paconiae* has been reported as causing leaf blotch in Massachusetts, and *Coniothyrium* sp., a stem canker and wilt-causing factor is found in California. Root knot seems to be a general disease of all peonies.

branch suddenly wilts and droops, it should be cut off and burned. Little will be lost except the diseased part, for Botrytis blight seldom kills a tree peony. Spraying with Bordeaux during the early growing stages will act as a preventive.

Propagation

Tree peonies are propagated by grafting, dividing and layering. Though most experts agree that grafting is by far the most rapid and satisfactory method, the propagation of these plants has long been a matter of dispute and experimentation. If grafted on "wild" tree peony roots as is done by the Japanese, trouble is likely to appear in the form of untrue shoots from the roots. These shoots generally grow rapidly and succeed in killing the desired grafted variety. Grafting on roots of herbaceous peony, by the cleft method, is much safer and is the method used by a majority of propagators. The tree peony scion is grafted to the root tip of a herbaceous peony. The herbaceous root tip has no bud or eye which can sucker and has just enough vitality to support the tree peony until it develops its own roots. If the herbaceous understock should sucker, its foliage would be distinct and easily removed.

Dividing is another method of propagation but is considerably slower than grafting. Layering is less practical than dividing; it is slow and uncertain. Experiments with cuttings have thus far proven unsuccessful.

Varieties

It is advisable to purchase two or three year old vigorous plants. They are easier to establish and will bloom the second season after planting, sometimes the first season. If flowers are wanted the first year, purchase four to six year old plants which have already bloomed.

Seedlings may be desirable, but only a small percentage of them are equal to the named varieties; most are not as good. The seedlings generally run to magentas, a few whites and pinks, very few scarlets and almost never any crimsons. Among the following are some of the better named varieties:

Japanese

Whites

Tama-sudare (Jeweled Screen)
Hira-no-yuki (Snow of Hira)
Renkaku (Flight of Cranes)
Genkimon (Topaz Gate)
Yaso-okina (Venerable Man)
Gessekai (Kingdom of the Moon)

Pinks

Momo-yama (Mountain of Peach Orchards)
Shintenchi (New Heaven and Earth)
Yae-zakura (Very Double Cherry)
Yachiyo-tsubaki (Long Hedge of Camellias)
Sakura-jishi (The Lion in the Cherry Orchard)
Hana-kisoi (Floral Rivalry)

Reds

Hodai (Reign of Chinese Emperor Ho)
Ima-shojo
Hinode-sekai (Landscape at Dawn of Large Scale)
Nissho (Sunbeam)
Yo-meimon (The Most Gorgeous Gate of Japan)
Impumon (Gate of Opulence)

Purple, Violet, Mauve

Horakumon (Gate of Abundant Pleasure)
Kenreimon (Gate of Kenrei)
Rimpo (Bird of Rimpo)
Shiko-den (Palace of Violet Light)

Plants of the purple, violet, mauve group seem to be more vigorous than the maroons, scarlets, and many pinks and whites; also the flowers are usually larger.

Gottscho-Schleisner

The tree peony Flight of Cranes or White Dragon

European

Of the European varieties, Reine Elizabeth is the finest and best. It is a rich salmon pink. Bijou de Chusan is the finest of the European whites. Souvenir de Ducher (purple), and Jeanne d'Arc (pink) are outstanding.

Lutea hybrids

Of the lutea hybrids, L'Esperance is perhaps the most beautiful. Other good ones are Satin Rouge, Chromatella, Alice Harding, Black Pirate, Souvenir de Maxime Cornu, Cosair and Silver Sails.

The lutea hybrids are not as effective in the garden as the European or Japanese varieties because the flowers are borne close to the foliage of the plant and tend to droop, or hang downward. In spite of their drooping habit the lutea hybrids are well worth growing for their perfect lemon scented flowers. Recently a lutea species was found in Tibet which has erect blossoms on strong stems. Peony experts generally agree that the promise of much improvement is foreseen in the offspring of this Tibetan form if it is crossed with the present lutea hybrids.

A single blossom floating in a shallow dish on a dining table is breathtaking in its beauty.

The popularity of the tree peony is constantly increasing. The supply has not been keeping up with the demand, which is an easily understood situation to one who has seen or grown them. This aristocrat in the flower world—"the king of flowers"—should grow in every garden.

Classification of Tree Peonies

(after Rehder)

A. The Moutan Tree Peonies (Suffruticosa Group)

suffruticosa—includes both the European and Japanese varieties

B. The Yellow and Mahogany Tree Peonies (Delavayi Group)

delavayi—the oldest and presumably most primitive species (dark mahogany)

a. *alba*—creamy white

b. *acutiloba*—deep crimson, golden anthers

c. *angustiloba*—dark mahogany red, yellow stamens

d. *vera*—single, dark mahogany-crimson

lutea—wild yellow tree peony of southern China

potanini—flowers white, shaped like a Trollius

C. The Yellow Tree Peony Hybrids

lemoinei—(*lutea* × *suffruticosa*)

Ann Hume photo

"Where winds are eternal . . ."

WINDSWEPT TREES

. . . fight for survival

Robert E. More

MAN'S eternal struggle against the forces of nature has, perhaps, created a sympathetic interest in any similar struggle by other living things. Whether or not this be the explanation, certain it is that there are few humans who do not find great fascination in windswept trees. On the tops of high mountains, where winds are eternal, few plants have the stamina to live; the survivors have to be truly rugged. Once a tree has withstood the ravaging elements and has become established it is very apt to reach old age. It is in these aged trees that the most interesting forms are found.

Whether in the mountains or along the cliffs of rocky coasts, where most windswept trees are found, there is little soil. And what little there is possesses almost no humus. Soil is swept to the valleys below about as fast as it forms, except where lodged in tiny cracks and crevices. While precipitation is frequent, evaporation is almost instantaneous, so the trees that survive have little moisture to absorb. With the elements against them, the windswept trees grow with incredible slowness and must be tenacious of life if they are to reach maturity.

The wind not only molds permanently the form of these trees but with sand

Author photo

The "Praying Mantis Tree" on Colorado's Mount Evans

Author photo

A wind-beaten Limber Pine high on a rocky ridge

blasts it sculptures them. High up on Colorado's Mount Evans is to be found one of the most-often photographed trees in the United States. It is called the "Praying Mantis" tree, because centuries of assaults upon its trunk by violently blown sand and gravel have carved upon the windward side a grotesque shape precisely like a praying mantis.

On the east side of the Continental Divide the wind is always from the west; and on that side no bark or foliage remains on living trees. The limbs on the leeward side all stream out with the wind. Only a few trunks stand upright. Usually the trees spread along the ground in prostrate mats gaining protection from excessive loss of moisture, and at the same time conserving the scarce moisture of the soil.

Streaming dramatically in the wind, the windswept trees seem to be relics of another era. Their twisted, tormented, almost surrealistic forms are living proof of the struggle against the forces of nature, and in the observer's imagination they may become symbolic of the eternal fight for survival.

LILIES IN VIRGINIA

Ten years' experience of an amateur

Caroline R. Bresee

GROWING Lilies in Virginia is far from the tedious, backbreaking, and discouraging task that many of my gardening friends led me to believe. The truth, I have since learned, is that these people never gave the Lily bulb a chance to grow into its full beauty. It was the late Violet Niles Walker, the real Lily sponsor in this vicinity, who convinced me that I was misinformed. Her Lily garden was so beautiful, and she was so enthusiastc, that about ten years ago I planted my first Lily bulb.

Lilies seem to grow very readily in the temperate Virginia climate. Of course, as in other localities, an exceedingly long dry spell calls for a thorough watering of the beds; this, though, is true with all flowers.

The proper soil presented a real problem, and it took a considerable amount of experimenting and interrogating of friends to find a satisfactory mixture. The predominating soil in Orange County, Virginia, is known as Davidson clay. While this is excellent for farm land, it is entirely too heavy and holds too much moisture for Lilies. All of my Lily beds are at least 2 feet deep. The newest ones have a good foundation of coarse gravel (to assist drainage) under a mixture of equal parts of local soil, rich woods loam, and sand. This has worked excellently, for while the combination permits good drainage, the leaf mold tends to stay damp and also serves as a sort of light mulch. Up to this point I have been referring to the planting of bulbs, only because most flower gardeners want quick bloom which cannot be realized from Lily seeds.

Raised from Seed

Growing Lilies from seed is most fascinating and really quite easy. For those who wish Lilies in profusion, I would certainly recommend a few seed flats. These need not be large or deep: a convenient size is about 2 feet long, 18 inches wide, and 4 inches deep. A few small holes in the bottom, a little gravel and light rich soil—and then the seeds may be planted. There are many types of soil which may be used, but I like a combination of leaf mold, sand, and peat-moss in equal parts. Vermiculite, a patented sterile "soil," has also given excellent results, but for several reasons, I still prefer the mixture of my own.

It is when the small bulbs are transplanted that the highest mortality occurs. Unless great care is exercised, damping-off will kill a good many of the small plants. During my brief endeavors with seeds, I have raised and given away to friends and garden club members at least two thousand bulbs of various sizes.

Among the many kinds of Lilies I have raised from seed are the Regal Lily (*Lilium regale*) and its hybrids, the Coral Lily (*Lilium pumilum*, or *tenuifolium*), and *Lilium umbellatum erectum, Henryi, amabile,* and *Leichtlinii* var. *Maximowiczii;* also Green Mountain hybrids, Havemeyer, and a few more.

A great many of my bulbs came to me through the test collections of the Garden Club of Virginia and the Dolly Madison Garden Club, but I believe all of these that are referred to in this article are obtainable from commercial bulb growers.

Best Kinds

According to my experience, some of the most satisfactory Lilies for northeastern Virginia are the following:

The Regal Lily and its hybrids have bloomed profusely on tall sturdy stems.

Lilium Henryi stands some of our hot dry July weather exceptionally well.

The Coral Lily, a small early-blooming

A niche in a Virginia garden *Gottscho-Schleisner*

Lily easily grown from seed, adapts itself nicely to rock gardens.

Lilium amabile is a hardy Lily, and has a long blooming period.

Lilium umbellatum erectum is a grand, sturdy Lily, easily raised from seed.

These Lilies have been outstanding with me, but I have been successful also with the following:

Candlestick Lily (*Lilium dauricum*)
Easter Lily (*Lilium longiflorum*)
Nankeen Lily (*Lilium testaccum*)
Showy Japanese Lily—pink form (*Lilium speciosum rubrum*)
Tiger Lily (*Lilium tigrinum*)
Turks-cap Lily—white variety (*Lilium Martagon* var. *album*)
Lilium Dalhansonii
Lilium princeps
Lilium Scottiae
Lilium Szovitsianum
Lilium tsingtauense
Lilium Willmottiae (or *Davidii* var. *Willmottiae*

Brenda Watts	Grace Marshall
Edna Kean	Guinea Gold
Ellen Willmott	Hurricane

There are two Lilies that I should like to mention particularly, not only for their great beauty, but also for their peculiarities. One is the Goldband Lily (*Lilium auratum*), which, I believe, should be raised from seed to keep continual bloom; the bulbs flower for one or two years only. The other is T. A Havemeyer, with large, pale yellow trumpets on a stem about 7 or 8 feet high. The difficulty is that the stem is never strong enough to support the beautiful flowers. In spite of these drawbacks, the Goldband Lily and T. A. Havemeyer should be in every garden, for their great beauty makes them well worth the little extra effort needed.

In ten years' time, my interest in Lilies has grown as fast as my Lily garden. From one small bed, in 1938, my Lily garden has grown to eighteen beds—all of this, too, without my ever having had the help of an experienced gardener. This alone should emphasize to everyone the fact that Lilies are easy to grow and no trouble to maintain—at least, I have found that to be true; and I sincerely hope many readers will likewise find it so. Lilies have given me a great deal of pleasure.

LILIES FOR WEST COAST GARDENS

All types and colors

Edgar L. Kline

THE time is not far past when the feat of establishing even one kind of Lily in a garden was viewed with a considerable amount of awe by fellow gardeners; and when an attempt to give cultural instructions or selections for a place even a mile away (much more, a thousand miles) would have been considered pure folly. This situation, fortunately, has been changed, and is being changed rapidly now with the advent of many new hybrids which are of easiest culture, and the development of American-grown stocks of those species which have long been garden favorites. While there is always room for controversy in a discussion on the successful culture of any large group of plants in an area so widely varied as the west coast, the fact remains that there is a sizable group of Lily species and hybrids for which an over-all recommendation can be made as to their reliability under the soil and weather conditions of this region.

In the interest of expediency, it seems best to divide the Lilies under discussion into two groups, namely: those which can be expected to give a good account of themselves under all practical conditions, and those which, though not to be considered difficult, require a little more care in selection of planting location, soil conditions, and so on. We need not be concerned here with those Lilies which need a specialist's care, no matter what their inherent beauty may be.

Easy to Grow

Trumpet Lilies. Of top interest to many Lily enthusiasts, be they beginners or advanced gardeners, are the large-flowered white trumpet Lilies; and fortunately there are many varieties of these which are of easiest culture. The Regal Lily (*Lilium regale*) has long been a favorite in this group, and can always be highly recommended. But recent years have seen the introduction of numerous hybrid strains which are superior in flower form and color and are just as vigorous. Among the best of these are the Centifolium hybrids, Crow's hybrids, and the Princeps group, the last including one of the finest of all white trumpet Lilies—George (C.) Creelman. With further hybridizing work we shall shortly have many fine yellow and pink trumpets; in fact, two groups, one with yellow and one with buff flowers, are now available: the Sulphur hybrids and the Aurelian hybrids (trumpet type), both of which are apparently easily established under ordinary garden conditions.

The Easter Lilies, another group of trumpet Lilies (varieties of *Lilium longiflorum*), have only recently come to be appreciated as garden plants. Formerly thought too tender for outdoor planting, these Lilies have now been proved hardy and readily adaptable to practically any garden situation in the west coast region. For outdoor planting, the taller forms (such as the Estate Lily) make the better showing, although the shorter types (such as the Croft Lily) are just as reliable.

The **upright-flowering** Lilies are of easiest culture under west coast conditions. Included in this group are the varieties of the Candlestick Lily (*Lilium dauricum*), *Lilium elegans*, and *Lilium umbellatum;* also the Star Lily (*Lilium concolor*). Although there is a considerable amount of confusion and duplication in the first three groups, it is generally conceded that the *Lilium elegans* and *Lilium umbellatum* varieties are garden hybrids, the former originating in Japan, the latter in Holland; and the varieties of

McFarland photo

Regal Lily (*Lilium regale*) with day-lilies (*Hemerocallis*) in the background

Lilium dauricum are from species native to China and Japan. The varieties of *Lilium elegans* are usually of shorter stature than the other groups, and carry fewer flowers; but their color range is greater than that of the varieties of *Lilium umbellatum* or *Lilium dauricum*—ranging from light apricot-yellow shades through orange and orange-red to deepest wine red. Seedling strains of *Lilium elegans* are being developed which come reasonably true, and these are particularly attractive in the brighter colors. *Lilium umbellatum* is available in many named varieties, ranging from light orange to deep red; and the varieties of *Lilium dauricum* are in the lighter shades of yellow, apricot, and orange. The Star Lily (*Lilium concolor*) and its varieties are short, small-flowered plants in colors from bright red to lemon-yellow.

The **recurved** species and their hybrids provide the largest group of dependable Lilies for west coast culture. Although new introductions will no doubt render any list incomplete within a few years, the following can be relied upon to give a good account of themselves under most garden conditions.

Lilium amabile and its yellow variety.

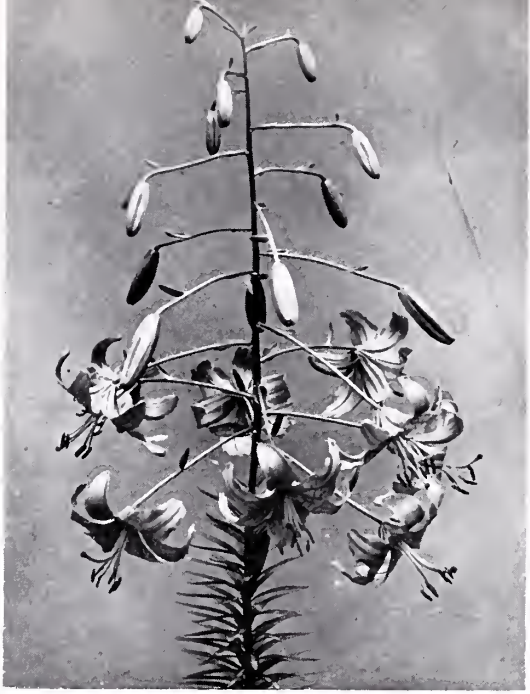
The Bellingham hybrid group, comprising the named varieties Shuksan, Cyrus Gates, Star of Oregon, etc., and the seedling strains obtained from them.

The Preston hybrids, including about a dozen named varieties, in colors ranging from yellow through orange to deep red.

The tall, orange-red Lilies—*Lilium Davidii*, *Lilium Leichtlinii* var. *Maximowiczii*, the Maxwill Lily, and their shorter companion, *Lilium Willmottiae*.

Fire King, Margaret Johnson, *Lilium Scottiae*, and Skyrocket—all hybrids of extra merit, in colors from Chinese coral to brick red.

Lilium Henryi, a tall, late species, with orange-yellow flowers.



McFarland photo

Lilium scottiae, a cross between *Lilium willmottiae* and *Lilium elegans* variety Mahogany

Courtesy of Mrs. Helen M. Fox

White form of Showy Japanese Lily (*Lilium speciosum*)

The Leopard Lily (*Lilium pardalinum*) and the Sunset Lily (*Lilium pardalinum* var. *giganteum*), probably the easiest to grow of all our native Lilies—or hybrids of them.

The Coral Lily (*Lilium pumilum*, or *tenuifolium*) and its variety Golden Gleam, small-flowered Lilies with bright red and orange-yellow flowers, respectively.

None of the Lilies mentioned thus far needs any special care beyond the basic requirements of all Lilies, namely, good drainage, well-prepared soil, and proper planting depth and location.

Needing More Care

This brings us to those Lilies which require a bit more cultural care in order to become established with a degree of permanency. A few cultural do's and don't's may prove of assistance.

The Goldband Lily (*Lilium auratum*), with its varieties, probably the grandest of all Lilies, fails usually because of poor planting technique, or the inroads of disease. It should be planted shallow, not over 6 inches deep, in partial shade, and isolated from other Lilies except wild collected natives and seed-grown stock known to be disease-free.

The Martagon-Hansonii group includes the Turks-cap Lily (*Lilium Martagon* and its variety *album*) and *Lilium Hansonii*, with their hybrids, such as the Backhouse hybrids, the Marhan hybrids, and *Lilium Dalhansonii*. Although these Lilies are of generally easy culture, their failure to flower well can usually be attributed to a location that is too sunny. They should have a considerable amount of shade, more than the Goldband Lily; and should be planted rather shallow, not over 4 inches deep.

The Madonna Lily (*Lilium candidum*) and the Nankeen Lily (*Lilium testaceum*) may be grouped together, as their culture is much the same. They should be planted very shallow, only about 2 inches deep, in a sunny location. The plants should be sprayed periodically until flowering time with Bordeaux or micronized copper for protection from attacks

of the Botrytis blight, to which they are most susceptible.

Lilium cernuum should be as easy to grow as the Coral Lily, but it occasionally fails when planted in a hot, dry situation. It needs partial shade and shallow planting.

Several of the native Lilies of our east and west coasts are well adapted to garden conditions. The easiest of these are the Leopard Lily, mentioned previously, *Lilium columbianum, Lilium Humboldtii* var. *magnificum,* the Meadow Lily (*Lilium canadense*), and the American Turks-cap Lily (*Lilium superbum*). The last four "appreciate" a partly shaded location, a light woodland soil, and sharp drainage. Failure to provide some semblance of their native haunts is the usual cause of losses.

Lilium formosanum is one of the quickest and easiest of all Lilies except for its susceptibility to disease. Isolation, as in the case of the Goldband Lily, is the accepted procedure; but *Lilium formosanum* should be planted in full sun.

Pink Lilies, unfortunately, are but few in number; and so it is advisable to take special care with those that are most readily established, namely *Lilium rubellum* and the pink form of the Showy Japanese Lily (*Lilium speciosum rubrum*). Both require partial shade (at least shade from afternoon sun), a light, well-drained soil (but plenty of moisture during the growing season), and much shallower planting than is usually advised—not over 3 to 4 inches for *Lilium rubellum,* or over 6 inches for the Showy Japanese Lily. Other varieties of the latter, such as the white form, *Lilium speciosum album*, require the same culture.

The Havemeyer and Aurelian hybrids (new hybrid seedlings derived from T. A. Havemeyer and *Lilium aurelianense*) apparently present no great cultural problems. They are so excellent, however, that it is advisable to use every care possible to guard against their loss. Regular spraying to ward off Botrytis is advisable, and planting in light shade in a situation protected from high winds. The planting depth is the same as for the Goldband Lily.

West coast gardeners are indeed fortunate in having such a variety of dependable Lilies to choose from; and the increasing public interest each season is most encouraging to those hybridizers and growers who are contributing to the bulb stocks now available.

LILIES FOR INDOOR DECORATION

The cutting of Lilies for decoration is likely to weaken the bulb so that it will not make a good plant the following year; if enough of the stem is removed to make an attractive specimen, too much of the foliage is taken away. The leaves are the food factory of the plant; they manufacture the carbohydrates, which are stored in the bulb and produce next year's flowers. The foliage, therefore, must be preserved throughout its normal life. The Madonna Lily is the most suitable Lily for cutting, since its upper leaves are short and the bulk of the foliage is on the lower two thirds of the stem.

Lilies for cutting should be grown in a cutting garden, maintained especially for that purpose.

LILIES AND ALKALINE SOIL

A report from Saskatchewan

Percy H. Wright

IN THE SUMMER 1949 issue of PLANTS & GARDENS is an article by L. H. MacDaniels on the wild lilies of of eastern America. The article is actually entitled "Wild Lilies of the Eastern United States," but Dr. MacDaniels also mentions lilies that grow in Canada—as far west as Alberta.

Wood Lily

One of the most interesting lilies in the world is the Wood lily (*Lilium philadelphicum*), because of its extremely northerly habitat and its refusal to thrive under domestication. Here is what Dr. MacDaniels has to say about it: "The Wood lily . . . is widely distributed in the northeastern and North Central States and Canada. I have found scattered plants in northern Canada along the rivers flowing north into James Bay. The plants are usually solitary or scattered, and bear (each) only a single bright red flower—at most two or three. Apparently confined to strongly acid soils, it usually does not persist in the garden under conditions where the Meadow lily and the American Turks-cap lily thrive."

Further south than the area described, this lily grows more vigorously. In my part of Saskatchewan, I have found plants with as many as five flowers, surely a remarkable number for a lily with so small and insignificant a bulb. The widespread supposition that the Wood lily thrives only in strongly acid soils is hardly correct. It is native throughout Saskatchewan wherever the soil is moist enough for its liking, and Saskatchewan is so devoid of acid soils that the provincial Department of Soils recommends that lime should not be applied anywhere, except possibly under extremely unusual conditions and after the most careful investigation. The danger is of chlorosis from too much lime rather than of acidity for lack of it.

The Wood lily grows freely in the fields about my nursery and gardens at Moose Range, Saskatchewan, in the far northeastern part of the settled area of the province. In this particular locality, lime is extra abundant, and chlorosis is frequent in many plants, even in the wild willows and sometimes the poplars. The soil pH frequently varies from 4.5 to 8.5 within a few feet. The low figure (soils with a pH of 4.5 are acid) is obtained by taking a sample of the rotted-down moss where it lies on top of the mineral soils in a layer varying from several inches to a foot in thickness. This layer can hardly be called soil. The higher figure (pH 8.5 is alkaline) is found where the humus layer has been entirely burned off the top, leaving the exposed subsoil for man's plants to be content with.

The truth is that the Wood lily exhibits no discernible preference for either soil type. It thrives on the mossy spots in the rainier years but does less well in dry years, probably because of the quickness with which a high-humus soil dries out. It also accommodates itself to the subsoil.

The railway right-of-way passes near my gardens, and on either side of the embankment is an excavation about five feet deep. The soil at the bottom of this excavation is pure subsoil—infertile, lacking in humus, and extremely high in lime content. On the other hand it collects water during the spring run-off and has greater moisture throughout most of the summer than the adjacent fields and woods. The Wood lily seems to thrive here as well as elsewhere. In fact, after two successive dry years, most of the lily plants left in the neighborhood were here alone.

Other Lilies

I have a notion that in the past altogether too much attention has been given to the pH of the soil by those interested in lily culture. In my garden I have *Lilium elegans, L. umbellatum, L. dauricum* (the Candlestick lily), *L. amabile, L. willmottiae* and *L. tigrinum* (the Tiger lily), plus large populations of the Stenographer hybrids and their seedlings. All do well on the high-lime soil type. To make them thrive I have to be generous with applications of fertilizers rich in nitrates, including ammonium nitrate. None of these lilies has shown any sign of chlorosis, except for one variety of *L. umbellatum.*

I have grown other lilies that are more selective in regard to soil type. The Regal lily, for instance, does not do well on the high-lime soil. Neither does *Lilium martagon album* or its seedlings, nor *L. backhousei* and *L. duchartrei.* I cannot be so sure about *L. concolor, L. callosum* or the Coral lily (*L. pumilum*), but apparently they can be grown on either soil type. If my soils were not so extremely high in lime, the lack of adaptation of the Regal lily (*L. regale*) and the others named above might lead me to hesitate in saying that lilies in general are fairly adaptable in regard to pH. However, my contention is not that lilies have no preference at all for specific ranges in pH, but that their need for a certain definite pH has been overemphasized in past literature.

Fertilizer

Lilies have certain specific adaptations, but we should stress, rather than pH, the texture of the soil, its aeration and drainage, and in particular its temperature. Even fertility is important. How lilies can persist in the sterile soil of the railway excavation it is difficult to imagine, particularly as they must share with grasses and shrubs the meager resources of nitrates. In the garden, however, a high level of fertility is important. I can produce four to eight times the rate of increase of bulbs with the use of fertilizer than without it.

E. M. Kittredge Photo

Stalks of Wood Lily (*Lilium philadelphicum*)

Mulch

The advantage of mulching lilies has been overlooked. If a lily which is desired proves difficult, and one is sure that disease is not the cause, the most obvious experiment to make is to try cool mulches of various depths—adding enough nitrate to compensate for that drawn from the soil by the rotting process.

With the native lilies, as with many other wild plants, it often is difficult to determine the exact soil requirements. There are many integrating factors which make up environment and the presence or absence of but one of these may determine the success with which the plants will grow.

DEAD PLANTS

Why weep?

John C. Wister

WHY is it that gardeners get so excited and so distressed when a few plants die? The only real reason for gardening for most people is to find recreation from business or pressing problems; and if (instead of being a pleasure) it is a constant source of worry, it had much better be given up and golf or tiddly-winks substituted.

To distress oneself over a dead plant as if it were a person or an old friend is not appropriate. Of course it may be an old friend. I do not mean either to ridicule or to be unsympathetic with people who feel sorry that a great Box bush that they had all their lives has been destroyed. Of course they feel sorry; but if the plant is dead, it should be forgotten and a new one started.

Preventable Deaths

Much of the ordinary loss of plants is entirely preventable. Winterkilling may not be due to a severe winter so much as to the fact that the plant went into the winter in bad condition. Perhaps there had been a drought and the plant had been weakened. The gardener who is really interested in his plants watches them and gives them water in the fall if they need it. He fertilizes them in the summer months, if they do not seem to be well fed. He protects tender plants like Box from northwest winds. He certainly does not plant trees or shrubs of doubtful hardiness in exposed situations.

Desirable Deaths

In most gardens there are too many trees and shrubs; and often the death of a few plants is a blessing rather than a misfortune. The way otherwise intelligent people clutter up their gardens with ten times more plants than there is room for, passes all understanding. They think they must have every new plant they hear about, no matter how small the place is. It may not be any worse than crowding bric-a-brac on the table in the house, but it is more noticeable to passers-by.

It is said that one sign of an efficient manufacturer is a dump full of old machinery outside the factory. The man who discards old machinery quickly and puts in new and better types will be a better manufacturer. By the same token, the compost pile of any small place should be one of the most important parts of the garden; it should be filled with a lot of plants that belong there rather than in the living garden. The average

American garden should have about three fourths of its plants taken out and piled up to make good leaf mold for the future. If a few plants are winterkilled it is a blessing—and not something to worry over.

Many people, after a European trip, talk for hours about the beauties of the gardens in England and on the Continent. A great part of the charm of many of those old gardens is their simplicity. A lot of that simplicity was forced on the people. The Europeans of a century ago would have considered themselves fabulously rich if they had found themselves in the midst of one of our worst depressions. They were accustomed to doing without things. They did not have the money to spend on many plants, and so the few they bought were pretty carefully chosen. Furthermore, it was much simpler to get plants for the garden then, because there were fewer to be had. Explorers had not brought so many new things from China. E. H. Wilson alone doubled the number of hardy shrubs and trees which could be grown in the New England States. In doubling it, he not only added to our treasures and our joys, but also considerably increased our worries, by giving us more things to choose from.

Many plants die from their owners' neglect, but more die because they are suited neither to the climate nor to the particular place in which they are planted. If a plant suited for swampy conditions is planted in a dry back yard, its quick death is good fortune. It could never do well there. The sooner a plant suited to that particular environment is substituted, the more joy the gardener will have.

Of course no one likes to lose a favorite plant; but most garden losses are of plants which should never have been put in that particular place.

It Wasn't Dead

A huge larch in a New England garden was the prized possession of its owner when he rented the property to a man who thought that any tree having needles was an evergreen. The larch looked like any other "pine" to him. In the autumn, when the larch turned yellow and lost its needles the tenant thought . . . "the tree is dead." To keep the place trim and neat in the landlord's absence the tree was felled on a crisp December day and cut into fire-place lengths. The "dead" tree was now really dead. The tenant did not know that the larch or tamarack is a deciduous conifer. It loses its needles every winter and clothes itself afresh each spring.

To be dormant is not to be dead. Dormancy is a phase of rest in the cycle of plant growth. To confuse dormancy and death can be disastrous to a choice plant, as it was to this beautiful larch.

Larch in winter

Gottscho-Schleisner—courtesy of Home Garde

McFarland photo

AN UNUSUAL HEDGE PLANT

Trifoliate-orange

Charles F. Doney

ONE of the plants in the Botanic Garden that never fails to arouse the interest and curiosity of visitors is the Hardy-orange or Trifoliate-orange (*Poncirus trifoliata,* formerly *Citrus trifoliata*). Though its home is in eastern Asia, it is fairly healthy in Brooklyn and is injured only in severe winters. It is a large shrub or small tree of 10 or 15 feet, with oddly angled or flattened branches that stay green for several years and are armed with stiff, sharp, very effective spines. In a milder climate, where it is dependably hardy, the Trifoliate-orange, with its stiff, interlacing, spiny branches, makes a splendid hedge plant.

Early in May, before the trifoliolate leaves (composed of 3 leaflets) unfold, the bare branches are dotted with large white scentless flowers. The fruit is a small, downy, aromatic orange about the size of a golf ball; and though it is quite inedible, it has appreciable ornamental value. The little oranges are so closely packed with large seeds that there is practically no pulp, and the fragrant rind is rich in a bitter unpleasant-tasting oil.

The Hardy- or Trifoliate-orange has been cultivated for centuries. In China the fruits are dried and used for medicinal purposes. Because of its hardiness it is sometimes used as a stock on which to graft less hardy varieties of Sweet Oranges. It has also been used in hybridizing in the hope of finding semi-hardy varieties. Crossed with a Sweet Orange, it has given rise to the Citrange, a fruit which has more appeal to the eye than to the palate; crosses have also been made with the Kumquat and the Calamondin.

Trifoliate Orange blossom →

Fruits and foliage of Trifoliate Orange ↓

STREETS ON WHICH

I think there is nothing that adds more to the happiness and comfort of city living than having a tree in front of one's house. Also, when I walk down a thoroughfare on which there are shade trees, I bless the people who planted them.

We have never properly faced the fact that we in New York City live in a sub-tropical climate in the summer. Our paved streets and city walks not only

CITY DWELLERS LIVE

New York Times photos (Courtesy Park Department, City of New York)

absorb the intense rays of the sun during the day, but they re-radiate the heat. The shade from trees gives much needed protection and comfort.

All of us human beings need to have a little touch of Nature around us, and nothing gives greater joy and more return for a small investment than a shade tree.

Iphigene Ochs Sulzberger

McFarland photo

JACOBEAN-LILY

Unusual flowers from a Mexican bulb

Rex D. Pearce

SPREKELIA formosissima (often listed in catalogs as *Amaryllis formosissima*) is a rather satisfactory garden bulb, blooming quite surely and freely. It is frost-tender in the sense that the bulbs and buds will not stand freezing; but the foliage will survive a fairly hard touch of frost.

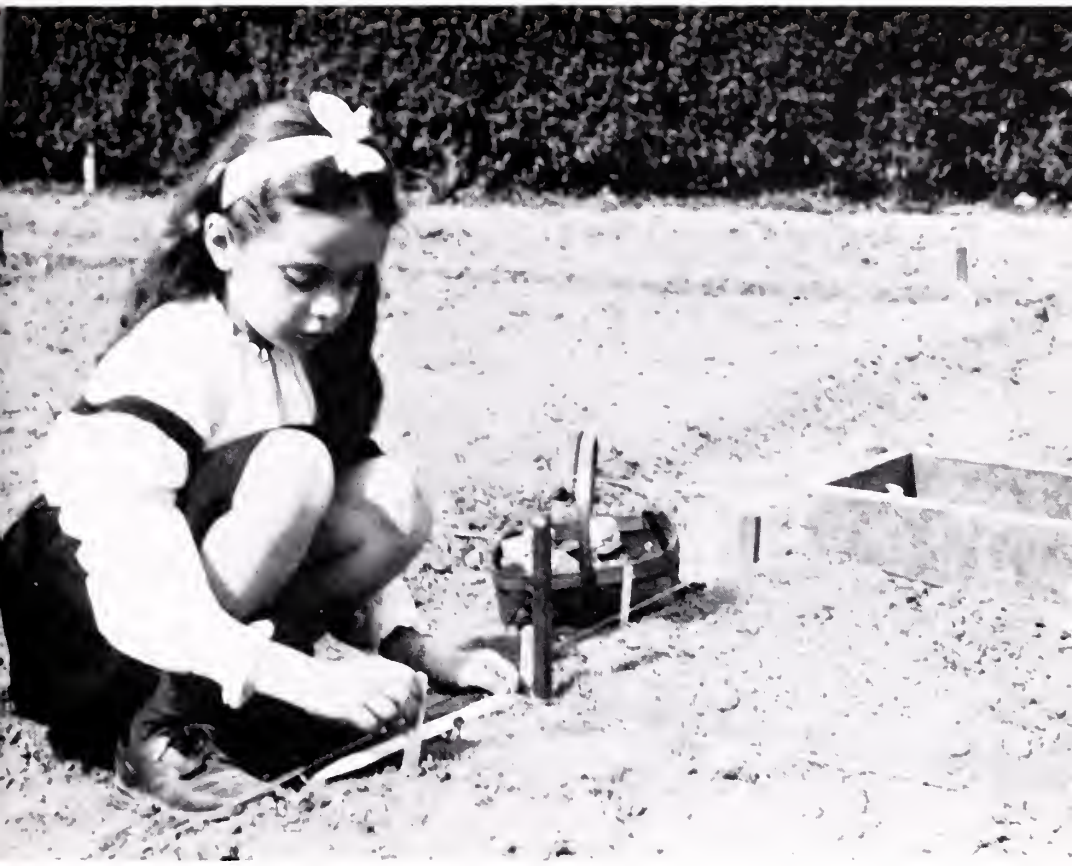
The bulbs should be planted outdoors just as soon as danger of freezing is past. The buds will already be well developed within the necks of the bulbs, and will be injured or blasted if the bulbs are held in storage too long in the spring. Flowers will show quickly after the bulbs are planted, often within ten days, on stems that rise to about 12 inches. The flowers are large, oddly formed, and of a rich velvety crimson. The anthers are loaded with pollen that somtimes falls on the petals in gold-dust effect. Not much foliage growth is made until after blooming, but then the many arching strap-like green leaves give good effect until late autumn.

The bulbs should be dug before the ground freezes, and the leaves cut off at the point where the green part emerges from the neck of the bulb. The bulbs should then be stored until spring in any dry, fairly cool, frost-proof place, preferably one that is on the dark side. The bulbs keep well; they need about the same storage conditions as Gladiolus bulbs, but are easier to keep because they require no special attention or packing. If the bulbs are kept in a place that is too light and warm, the flower bud will develop too rapidly in late winter and may blast before the bulbs are planted.

Sometimes Jacobean-lilies are forced for late winter bloom; then slightly warmer preforcing storage may be an advantage. They may be forced in soil, or given preparatory warm storage in water in the same manner as Hyacinths.

Jacobean-lilies set seed readily when blossoms are hand-pollinated. The seed germinates quickly, and by the third year seedling bulbs should bloom. Stock may also be increased by planting the offsets that naturally form from the larger bulbs.

Sprekelia is native to Central Mexico and southward into Peru and Bolivia. At least three varieties have been propagated and offered. Variety *glauca* has leaves somewhat blue-tinged and powdery; variety *superba* has slightly larger flowers than the type; and in variety *rosea* the flower coloring is diluted to what might be termed a rosy red. For general use the type form, with large crimson flowers, is about as satisfactory as any of the varieties. A good place to plant it is in the perennial border, near the front. Sprekelia has several common or folk names—Aztec-lily, Mexican Fire-lily and Jacobean-lily, the last name from the fleur-de-lis form of the blossoms.



FINGERS IN THE SOIL

Initiative and responsibility grow on a half acre where 230 children till the soil

Frances M. Miner

BE it sixty-nine radishes or thirty-four beans the first harvest is a thrilling experience to junior horticulturists. In the Children's Garden of the Brooklyn Botanic Garden they take home far more than radishes and beans. They take home visions through new doors which have been opened to them by working with plants and soil.

One young gardener was quite disturbed when his tomatoes failed to produce fruit. The plants were healthy but lacked tomatoes until the day an instructor saw Johnny picking off the blossoms . . . why? Because he wanted tomatoes on his plants and "not these old yellow flowers." Johnny learned the hard way that a blossom is necessary to fruit production and that fruits lead to seed which in turn lead to new plants and more flowers. Johnny took home more than tomatoes.

And then there was little blond Joan who asked, "Why aren't there seeds in radishes?" That answer could be grown —a radish plant was allowed to bloom and form seed. Joan learned that the edible part of the radish is not a fruit but is a part of the root system. Then

Tomato plants need an early start

One decision in a mid-summer garden is when to start a second crop

she began to notice that not only roots and fruits of plants are eaten, but also stems of asparagus, leaves of spinach, leaf stalks of celery, and the flower buds of broccoli. The radish seed Joan planted that spring sprouted far more than round, red radishes.

The Saturday morning classes which begin early in the spring, indoors and in the greenhouse, prepare each child for actual gardening. Soil is prepared, seed sown in pots, and the seedlings pricked out and planted in flats. A garden plan is laid out in chalk on the floor and each child learns how to measure rows and space the seeds of beans, carrots, and lettuce. Succession plantings are planned and many different vegetables selected—children like variety. More important, perhaps, is the choice of some

"Watch your feet—that's somebody's garden!" Grown-ups guide but children's cooperation makes this garden a happy place

Success! The first crop goes home with the serious gardener of Number 10

fast maturing crops such as radishes and spring onions—children are impatient for results. Two months is an eternity at the age of nine. But in their own garden where they watch vegetables grow, Jimmy and Peter and Agnes learn to wait. Though not as pretty as flowers, a vegetable crop is practical and edible. Youngsters like practicality and do not have to ask, "What's it for?"

Often the idea has been expressed that every child should have a puppy. Every child should also have a garden, for only in a garden can he learn to evaluate the true importance of plant life. A puppy is a living thing, so is a plant. It is necessary to know something of both.

An eight by ten foot plot may seem small for two young gardeners, but with care and a little planning they can reap

Homeward bound after a busy day

a bountiful harvest. The challenge of successfully growing beets, onions, corn and tomatoes carries with it the deep satisfaction of individual accomplishment. This is more lasting than soup greens and salad. The ability to work hard either together or alone, to respect the rights and property of others and to have a good time on the job—these too, are part of the harvest.

CRABAPPLES FROM SEED

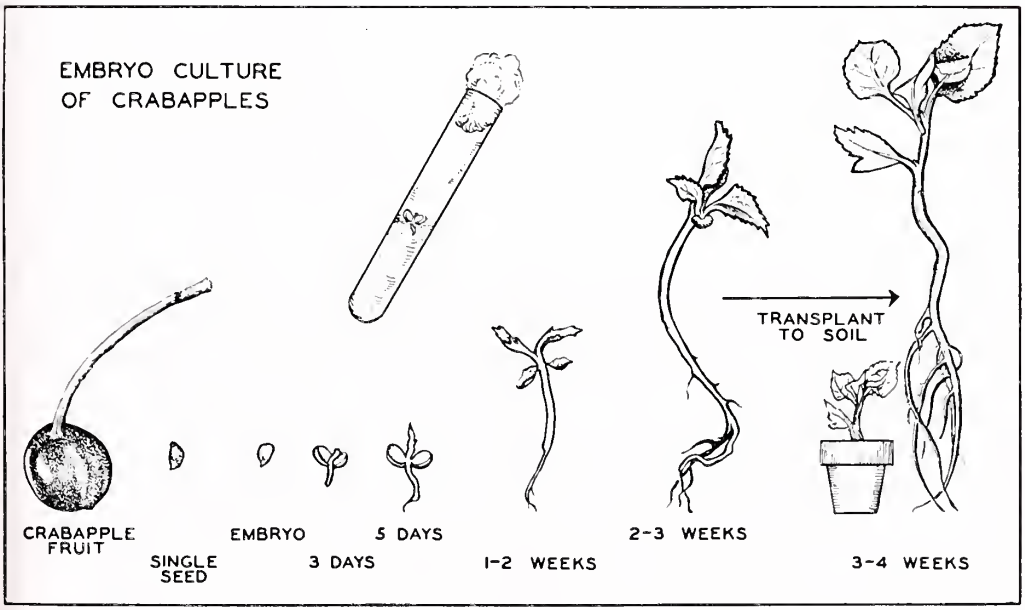
. . . undergo a hurry-up test tube technique

Louis G. Nickell

CRABAPPLE seeds planted in soil require a year or more for germination because the seed coat is extremely tough and does not soften readily in moist soil. As long as the protective coat remains impervious to water, the embryo plant within the seed cannot grow. When the resistance of the seed coat is finally broken down through absorption of water and action of soil bacteria, the rootlet of the embryo penetrates the wall of its prison and begins to grow in the soil. A new plant becomes established. This lengthy waiting period of germination in crabapple seed can be reduced to a few weeks by the use of a test tube technique known as embryo culture.

How It Is Done

After the small ripe crabapples are gathered, they are opened and the seeds are taken out. Under a dissecting microscope and bacteriologically sterile conditions, the hard covering of each seed, together with its inner lining, is removed. The tiny embryos are then transferred carefully to sterile test tubes which contain a jelly-like nutrient material (gelatin or agar with sugar and minerals). The test tubes containing the embryos are kept at 70° F. in a culture room where light is constant. Within two days the tiny embryo plants show signs of growth.



The seed is made up entirely of embryo and seed coats—no stored material except in embryonic leaves

Crabapple seedlings potted up after four weeks in the test tubes

The nutrient material nurses these young plants while they progress as shown in the accompanying sketches. The largest plant in the drawing is but three weeks old. Compare this with the twelve to eighteen months that the seed ordinarily requires for germination!

After four weeks in the test tubes the plants, each with from four to six leaves, are potted in soil and placed in the greenhouse. Their rapid development continues. The stems grow longer and heavier, and the number of leaves increases.

Further Development

After the embryo-cultured seedlings have been growing for about three months, they generally enter a dormant period when at least temporarily there is no growth. After another month they suddenly start to grow with renewed vigor. This second growth period is roughly equivalent to ordinary second year growth, but none of the "first year" leaves are lost. Thus, although the plants are physiologically in their second year, they are only five months old according to the calendar.

The significance of the use of embryo culture is evident. The plant in question, the particular weeping crabapple, grows in the Brooklyn Botanic Garden. Will its seeds produce plants with the weeping habit; that is, will the seeds come true, or will the seedlings revert to the upright form? The answer to this question, with this particular crabapple, must wait for

Crabapple seedling five months after start of embryo culture

perhaps two years. But since the seeds of this tree are ordinarily slow to germinate and produce a tree which would answer the questions, much time will be saved. Two years is a considerably shorter period than the four or five years —or even longer—that would be necessary if the seeds were germinated in the usual manner.

Earlier articles dealing with embryo culture technique appearing in PLANTS & GARDENS are: Embryo Culture of Iris Seed, L. F. Randolph, Winter 1945. Use of Embryo Culture in Rose Breeding, W. E. Lammerts, Summer 1946.

Nisei Photo Service (Courtesy of The Japan International Christian University Foundation, Inc.)

The daughters of Mr. Frank Okamura, caretaker of the Oriental Garden, stroll with their friend under the flowering cherry trees

WITHIN THE BROOKLYN BOTANIC GARDEN

RESTORATION OF THE ORIENTAL GARDEN

One of the most welcome events during Brooklyn Botanic Garden Week, May 1–7, was the opening for the season of the newly restored Oriental Garden.

Though it was officially re-opened last year after being closed for the duration of the war, a great deal of work was entailed in its restoration.

The Tea House, destroyed a year ago by juvenile arsonists, has been rebuilt and a considerable portion of the fence surrounding the garden has been replaced.

An article in the New York Times (May 2), describing the opening day, quotes the gardener, Frank Okamura, to the effect that the Oriental Garden was 'planted in philosophy.' Heaven is the highest point of the triangular landscape. Man is represented by the second highest hill, and the two boulders at the edge of the lake represent the Earth.

The garden was built in 1915 which takes it back almost to the beginning of the Botanic Garden. While it covers little more than an acre, it includes in addition to the lake, a small island, waterfalls, hills, bridges and connecting paths. One of the most interesting structures is a Torii or gateway that rises directly out of the water. A torii always indicates the approach to a shrine, in this case the Inari shrine which once stood on the hill that represents "Heaven."

Few flowers appear on the grounds for this is a Japanese Niwa Garden or landscape. However, there are many flowering trees and shrubs, Cherry, Plum Azalea and Wisteria, to mention a few, that bring springtime color.

Even in the dead of winter, because of the many evergreens used in its design, the garden continues to be an attraction.

JAPANESE DWARF TREES AT THE BROOKLYN BOTANIC GARDEN

On June 5, 1925, a collection of thirty-two dwarf Japanese trees and shrubs was given to the Botanic Garden by Mr. Ernest F. Coe, then of New Haven, Connecticut. The collection included Pines, Junipers, Cypress, Oaks, Maples, Aucubas, Skimmias, Palms, Azaleas, Wisteria, Euonymus, Bamboo, and Ilex.

Eight of the thirty-two original specimens are still alive and but little changed from the state in which they were received twenty-five years ago. They have had a minimum of care, consistent with maintaining them in good health. They have not been pruned or trained since their arrival; nor have they been transplanted, except when their pots were accidentally broken. Most of them are still growing in the same containers in which they were received. They have remained constantly in the greenhouse throughout the years, but this does not prevent the deciduous trees from losing their leaves each autumn and bursting forth in new growth each spring.

The trees still living include two White Oaks approximately 80 years old; a dwarf Pine about 100 years old, a 75-year-old *Chamaecyparis obtusa,* and an Elm and two Maples 40 to 50 years old.

It can be seen from the photographs of the Pine and the Oak that potted trees may change but little in a quarter of a century. (See pictures on page 128.)

Dwarfed pine, about 70 years old, as it appeared 25 years ago

The same pine as it is today

A dwarfed White Oak 80 years old, as it appeared when received at the Botanic Garden 25 years ago.

The same oak as it appears today

BROOKLYN BOTANIC GARDEN

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To reach the Garden:

By Subway: from Manhattan, twenty-five to thirty minutes' ride from Times Square or Grand Central.

I.R.T., West Side (7th Avenue or Broadway-7th Avenue line), downtown express marked "New Lots Avenue" or "Flatbush Avenue," to Eastern Parkway-Brooklyn Museum Station.

I.R.T., East Side (Lexington Avenue line), downtown express marked "New Lots Avenue" or "Utica Avenue" or "Atlantic Avenue," to Nevins Street, step across platform and change to 7th Avenue or Broadway-7th Avenue train, ride to Eastern Parkway-Brooklyn Museum Station.

B.M.T., Brighton Beach line, downtown express or local to Prospect Park Station.

By Automobile:

From Long Island, take Eastern Parkway westward, and turn left at Washington Avenue.

From Manhattan, take Manhattan Bridge, follow Flatbush Avenue Extension and Flatbush Avenue to Eastern Parkway; follow the Parkway to Washington Avenue, then turn right.

BROOKLYN BOTANIC GARDEN RECORD

PLANTS & GARDENS

Autumn
1950

HERBS

HISTORY

USE

CULTURE

NEW SERIES
VOL. 6 NO. 3

AMONG THE CONTRIBUTORS TO THIS ISSUE

Dorcas Brigham, formerly professor of Botany at Mt. Holyoke College, specializes in herbs at her Village Hill Nursery, Williamsburg, Mass.

Phillip G. Deicher of Pasadena, California, is experimenting with herbs as ground covers and is successfully raising culinary herbs in the Mojave Desert where temperature reaches 105 degrees.

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Sherman K. Hardy and Mrs. Hardy package dried herb products from their garden at Lexington, Mass.

Elsa Huntley (Mrs. H. G.) of New London, Conn., values herbs for culinary and decorative purposes both out-of-doors and in the kitchen window garden.

Carlton B. Lees, Assistant Horticulturist at the Brooklyn Botanic Garden.

Joy L. Logee (Mrs. Ernest E. Martin) owner and operator of the Logee Greenhouses in Danielson, Conn., deals in many fragrant herbs and rare pelargoniums.

Eleanour Sinclair Rohde, English author, whose recent death ended a long career. Many delightful garden books are to her credit, including *Herbs and Herb Gardening, The Scented Garden, Old English Herbals* and *A Garden of Herbs.*

George L. Slate, Associate Professor, Division of Pomology, New York State Experiment Station, Cornell University, Geneva, New York, and well-known writer and authority on lilies.

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Martha Genung Stearns (Mrs. Foster), Exeter, New Hampshire. Editor of the *Herbarist* (official publication of the Herb Society of America) and writer of many articles on the growing and use of herbs.

Elizabeth Remsen Van Brunt, Honorary Curator of Culinary Herbs, Brooklyn Botanic Garden, speaker on herbs and gardening and Guest Editor of this issue.

Helen M. Whitman, herb grower at Salem Center, New York.

Janet Wright (Mrs. Charles H.) on the staff of the Huntington Library, San Marino, California, formerly Chairman of the Southern California Unit of The Herb Society and author of many articles on herbs.

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PLANTS & GARDENS

Styrax japonica

VOL. 6 Autumn, 1950 No. 3

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Autumn 1950

Perhaps the finest characteristic of the better-than-average gardener is that he is never quite content with what he grows; he is always searching for something new — a new kind of plant, new horticultural practices, or new ways to use the material he has. Readers of PLANTS & GARDENS may wonder, therefore, why this issue features herbs. To be sure, herbs are not new; they are among the oldest known garden plants. But for those who are about to try growing them for the first time, there is indeed a new experience ahead.

To enjoy herbs, whether from the gardening or culinary angle, or both, it is not necessary to grow a great many varieties. Try a few kinds that seem likely to enhance the beauty or extend the usefulness of the existing garden - there is an herb for almost every purpose.

It was with the thought of bringing readers a concise little book on the culture and use of herbs that we asked the Botanic Garden's long-time friend, Elizabeth Remsen Van Brunt, to be Guest Editor. Firmly established in the herb world, she could reach out for collaborating editors and key authors. Their joint efforts make this issue an important addition to the PLANTS & GARDENS shelf of 64-page "books."

For readers who do not want to graze exclusively in herb pastures, we have included other articles of diverse interest.

This letter is written from Scandinavia, and I have recently returned from Lapland, a hundred miles north of the Arctic Circle. There, at the end of July, tulips, snapdragons and chrysanthemums were blooming together. July is the only frost-free month, so spring, summer and autumn are telescoped into seven short weeks. Ornamental horticulture in the land of reindeer has some unusual points of interest, and we are going to tell you more about it in a coming number.

Sincerely yours,

George S. Avery, Jr.

Director

A potted Acanthus at The Cloisters, New York (see page 173)
Courtesy of the Metropolitan Museum of Art—Sheeler photograph

Carlton B. Lees photo

Herbs in the garden of a twelfth century monastery. The Cloisters Museum, New York

THROUGH THE YEARS WITH HERBS

. . . an extremely interesting group of plants

Dorcas Brigham

THE enthusiasm for herbs, which followed on the heels of the rock garden craze in America, has made more permanent converts than was thought possible. Perhaps one reason for this is that herbs not only have their roots in the earth, but deep in man's culture and represent many groups of plants.

But, you may ask, what is an herb? The most comprehensive definition would undoubtedly be, 'a plant which has economic properties—culinary, medicinal, or cosmetic—or is grown only for sentimental worth.' This gives the herb gardener plenty of leeway, so he need not feel too restricted. Annuals such as chervil, basil and sweet marjoram; biennials such as foxglove, caraway and angelica; perennials such as lovage, thyme and the mints—these are strictly herbaceous plants. But an herb garden may include rosemary, southernwood and winter savory which are shrubs; saffron (crocus) which is an autumn flowering bulb, and possibly a bay tree in a tub. These are herbs by right of their usefulness either in the past or in the present. As the herb gardener has a wide choice, perhaps it would be best for him to define herbs to best suit his need. Defined or not, this is an extremely interesting group of plants.

Herbs in History

Interest in herbs is no modern development, but down through the ages from the Ebers Papyrus, a medical text of 1500 B.C., through the writings of Theophrastus, Dioscorides and Galen to Vergil and Homer, to Gerarde, Parkinson and Culpeper we may trace the progress of herbs. Along with the arts, these plants found sanctuary in the monasteries through the Dark Ages. The monks of the Benedictine and Cistercian orders collected and cultivated herbs for condiments and medicines. With the break-up of the monasteries, beginning in 1534, many herbs became more widely distributed.

Spices and drugs, as much as gold, lured men to search for the shortest routes to far countries. As a result, new lands were discovered which contributed new knowledge of plants. During the sixteenth and the seventeenth centuries, the early physic and botanic gardens were established. Many herbals were printed. They borrowed heavily from the older manuscripts and contained information of medical usage, folklore and superstition. It is interesting to note in these herbals that until the seventeenth century botany and medicine were closely allied. New varieties of plants brought in by explorers also were described and some attempts at classification appeared. Many illustrations, although somewhat wooden, are realistic enough to be easily identified.

Herbs in America

Herbs were brought to America by the early settlers—old family remedies, flavoring herbs and some to put away with the linen, to be strewn on floors or to burn for fragrance. Some of these helped to disguise the taste of old meat before the days of refrigeration; some were used to dye homespun fabrics and some were used as love potions or witches' brews.

They were planted in sunny corners near the house to be available to the busy housewife. As villages grew, many nationalities arrived bringing herbs with them from far-away lands. The resulting exchange of slips and seeds and plants must have been extremely exciting. Later the art of growing and using herbs was dropped, except in Shaker communities where it flourished still in 1850. The Shakers took the lead in the cultivation of drug plants; for example, even as recently as 1935 in New Hampshire, output of valerian oil brought $10,000 annually. They also grew chamomile, wormwood, sage and lovage. A very evident escape, wild bee-balm, covers the hills about the old Shaker village near Pittsfield, Massachusetts.

During the first World War there was a decided shortage of some medicinal plants and products because of the embargo, and the growing of herbs was revived. Mrs. M. Grieve, an Englishwoman, was one who led in this revival and she published, in 1931, *A Modern Herbal,* giving in two volumes the medicinal, culinary, cosmetic and other uses of some thousand plants. The books are well illustrated and have a fund of information about British and American plants. They are excellent reference books, except that the alphabetical index of common names is a drawback because such names differ in various localities and countries. An additional index using botanical names would render these volumes much more useful.

The modern interest in herbs in this country—at least among the garden club members—seems to center in culinary use, in cosmetics, perfumes and potpourri. It is much more satisfactory to leave the administering of medicine to well-trained physicians. The herb garden has become a center of interest, discussion and enjoyment to many, not only because these historic plants reach into the earliest culture of man, but because they are effective as garden plants. Many are fragrant. Many add exciting flavors to the most commonplace dishes.

Gottscho-Schleisner

One of the stately herbs—Angelica (*Angelica archangelica*)

Herbs Much Used

Some herbs produce useful seeds; some, leaves, roots, flowers, or buds. Other herbs may produce two or more useful parts—dill, for example, produces flavorful seeds but the young leaves add a new highlight to tossed salad. Anise, caraway, and fennel are double performers along with many others. Possibly one of the most unusual of the plants is the autumn crocus (*Crocus sativus*)—the dried stigmas provide the key ingredient in saffron buns and other foods where yellow coloring is desired. Roots, seeds, leaves, flowers—most of the herbs more than earned their keep in ages past. Many continue to be useful even today.

Among the favorite herbs for culinary use are sage, the various mints, lovage, basil, caraway, thyme, chervil, parsley, burnet, chives, sweet marjoram, summer savory, sweet woodruff, and sorrel.

For fragrance and sentiment no herb garden is complete without rosemary, lavender, lemon verbena, pineapple sage, tansy, chamomile, costmary, lemon balm, rue and myrtle (the true myrtle, *Myrtus communis*—not *Vinca minor,* often called myrtle).

A few medicinal herbs may be included in the herb garden such as: gold thread, Joe-Pye-weed, thoroughwort, bloodroot, wild ginger, culver's root, coltsfoot, mandrake, foxglove and calendula.

Derris root, pyrethrum, hellebore and tobacco contribute substances used in insecticides.

Families of Herbs

A large portion of the herbs most commonly grown falls into three families: the mint, parsley and composite.

Mint Family (*Labiatae*): lemon balm, bush and sweet basil, bee-balm, catnip, clary, horehound, hyssop, lavender, pot marjoram, sweet marjoram, rosemary, sage, summer and winter savory, spearmint, thyme.

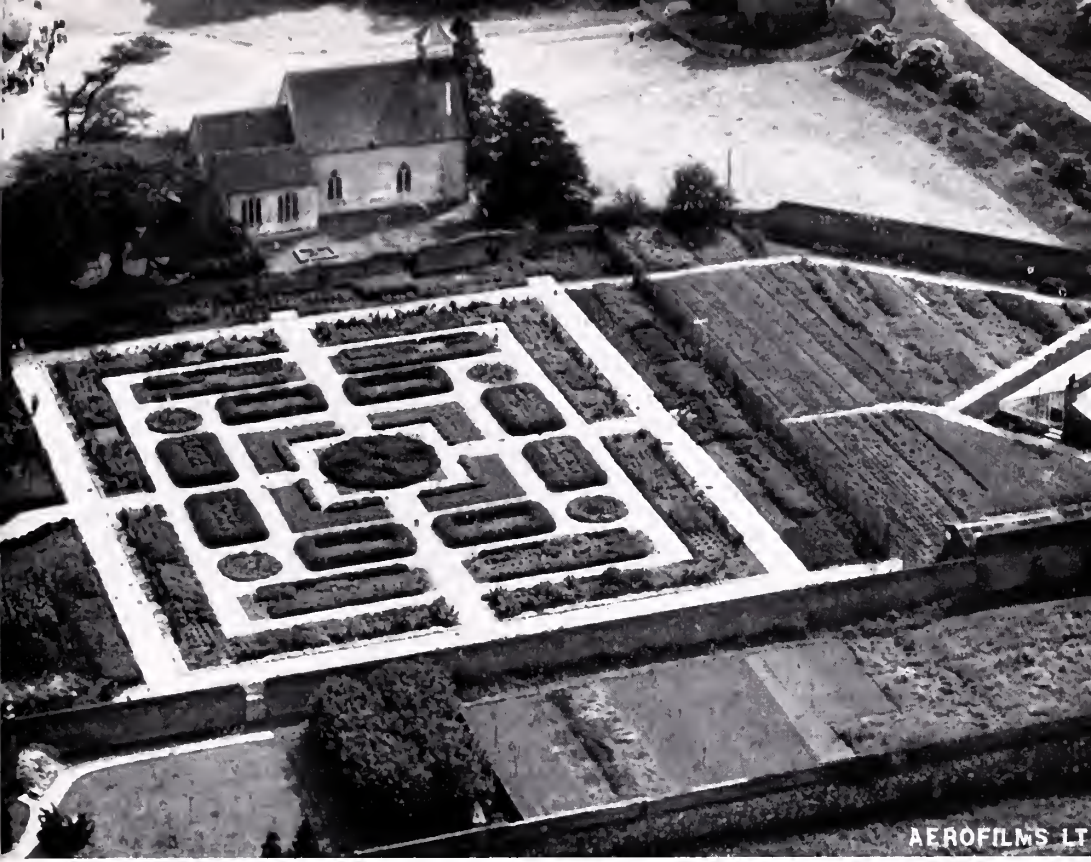
Parsley Family (*Umbelliferae*): angelica, anise, caraway, chervil, coriander, cumin, dill, sweet fennel, Florence fennel, lovage, parsley, sweet cicely.

Composite Family (*Compositae*): chamomile, costmary, elecampane, pot marigold, old woman, southernwood, tansy, tarragon, wormwood.

The Mustard family is represented by horseradish, black mustard, white mustard, peppergrass, watercress and upland cress.

All but a few of the culinary herbs prefer sun, so it is wise to plant the herb garden in a sunny spot protected from north winds, near the house for convenience.

If you have not grown herbs and are interested in them, begin with those mentioned as culinary favorites, then add a few others each year. It will not be long before you will be adventuring further into the useful as well as romantic realm of the herb enthusiast, but the affliction is not a bad one. Herb gardeners are many, and their enthusiasm breeds a companionship probably without parallel in any other type of gardening.



Courtesy of "The Herbarist"

The Heath and Heather herb garden at Lullingstone Castle, Eynsford, Kent

THE HERB GARDEN

". . . a whole tradition of mankind"

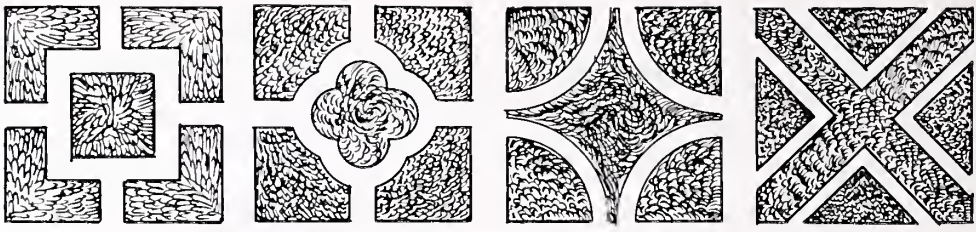
Elizabeth R. Van Brunt

A GARDEN of herbs need be no larger than the shadow of a bush, yet within it, as in no other, a mood of the earth approaches and encounters the spirit of man. Beneath these ancestral leaves, these immemorial attendants of man, these servants of magic and healers of his pain, the earth underfoot is the earth of poetry and the human spirit; in this small sun and shade flourishes a whole tradition of mankind.

HENRY BESTON

The most appropriate design for the herb garden is one based upon the cross with simple and uncluttered lines. The earliest gardens known to man were so planned, obviously taking fire from the verse in Genesis II, "And a river went out of Eden to water the garden: and from thence it was parted, and became into four heads."

Perhaps from this allusion stemmed the number four as the unit of Creation: four corners of the Earth, four winds of Heaven, four great Rivers of the birthplace of the human race. So strong was the influence of the number four, that garden design was based on this unit. Such gardens were easy to cultivate and

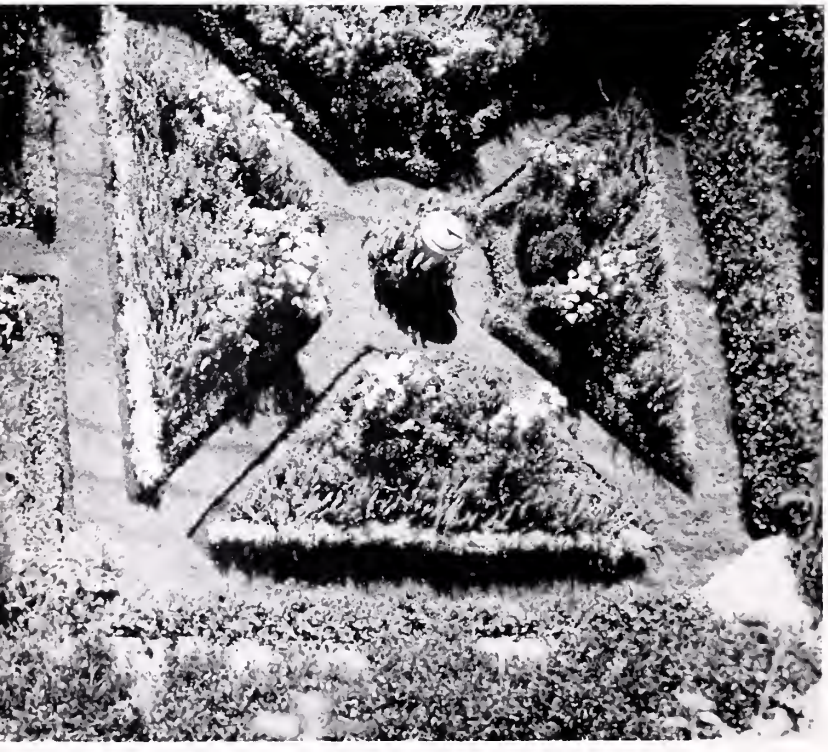


Four traditional plans for herb gardens

easily irrigated (a necessity in the arid Near East). For the women of the household the garden became a place to walk. Since the garden also needed some shade to protect it from the broiling sun, a tree symbolizing the Tree of Life usually grew near the center where it overhung a small pool. Water, shade and scent, plus an enclosing wall for privacy —what more could be desired in a garden even today?

In the walled monastery gardens of mediaeval days, space saving and the necessity of getting much from little determined the choice of a plan based on the unit four, each herb in a bed to itself for ease in identification when gathering for medicine or food.

Knot gardens evolved from lack of space and were elaborated as royalty found it pleasing to view such patterns from a window without having to descend



The garden of Mrs. Henry Wilson, San Francisco

Galen Wood photo

Louis Buhle pho

The herb garden, with Elizabethan knot gardens—Brooklyn Botanic Garden

into the garden. The pattern of varicolored clipped herbs such as santolina, Roman wormwood, teucrium or thyme, enlivened by the accents within the knot of individual blossoming herbs—borage or betony or roses—presented an effect of interlaced ribbons. This may be seen in several gardens of today: notably the herb garden at the Brooklyn Botanic Garden and the garden of Mrs. Henry Wilson in San Francisco, California. The sixteenth century knot garden at Hampton Court in England, is another noteworthy example of a patterned garden designed to be viewed from above.

Colonial gardens in America often followed the traditional four-square basic plan with variations. Herb borders near the kitchen doorstep were handy and provided a degree of safety against lurking Indians. Even today we may appreciate the former reason; having a handy herb patch on a hot summer's noon when about to turn the omelette is not a bad idea! A clump of frosty-leaved apple-mint under a kitchen window is a joy in iced-tea days, though esthetically one might like to think of a cool mint-bordered pool in the meadow—it would be rather far from the kitchen when guests appear unexpectedly.

Herbs may be used to advantage for foliage effects in the herbaceous border. When they are used as decorative accents or fillers, it would be a pity to harvest all the foliage of sweet basil or marjoram on a July morning, leaving blanks in the border's edge. The soft gray green of clary sage leaves, and the pastel spikes of bloom, or a clump of purple-flowered hyssop may add much to such a border with little loss to the culinary department.

Herbs may be planted naturalistically to create colorful effects. One danger of this type of planting is the difficulty of accurate identification. Rows well labeled are safest.

Paths in the herb garden are important and must be wide enough for two people to walk side by side. Turf walks never should be narrower than the lawn mower. Sanded paths are pleasant for walking and dry out quickly after rain if there is a cinder base. Gravelled paths are wonderful seed beds for weeds and self-sown herbs if you are not too neat a gardener and are not disturbed by weedy walks. Mellow brick, paving stone—both are expensive but durable if well laid and appropriate if your garden plan permits.

Edgings can be simple, the simpler the better. Cedar stripping takes the

Carlton B. Lees photo

A corner in a small herb garden in Westchester Co., N. Y. Shrubs espaliered against the low wall provide the herbs an effective background

Author photo

The author's herb garden

least space, and if weathered or stained, harmonizes with the garden. Brick or stone edging can be soundly laid for years of service. The smaller herbs such as thyme, teucrium, santolina and the alpine strawberry make attractive edgings if held in check by curbs of wood or brick.

Because privacy and shelter from boisterous winds is of great importance in a garden, walls should be considered carefully. If low, an outer planting of sweetbrier diffuses its delicious fragrance after a rain, and its height adds protection. Other species of roses make interesting plantings outside such a wall. A picket fence or a wooden paling covered with honeysuckle and roses is in keeping with a simply-patterned garden. A very effective herb garden feature would be a pigeon cote built into a corner of a stone or whitewashed brick wall. A serpentine brick wall encloses three sides of a charming garden in Media, Pennsylvania—the fourth side being the terrace of the house, opening from the dining room. Modelled after the famous serpentine wall of Thomas Jefferson's design at the University of Virginia, it creates more planting space than a straight wall for espaliered fruits and tender vines and shrubs that need a warm southern exposure to survive the winters.

Herb gardens have been many and varied down through the centuries. A wealth of material is available, in most libraries, to anyone planning such a garden. These plants have been prominent in the cultures of many lands, and volumes have been devoted to them.

There may be as many types of herb gardens as there are herb-gardeners. Each may reflect the personality of its owner. Alfred Austen said it well, "Show me your garden, provided it be your own, and I will tell you what you are like."

Author pho

A window garden of herbs—(from left to right) Rosemary, Pineapple Sage, Chives, Summer Savory, Dittany of Crete

SEVEN HERBS IN A KITCHEN WINDOW

. . . for your "owne fancie"

Elsa Huntley

IN 1629 John Parkinson, 'Apothecary of London,' wrote ". . . Yet I perswade my selfe, that Gentlemen of the better sort and quality, will provide such a parcell of ground to bee laid out for their Garden, and in such convenient manner, as may bee fit and answerable to the degree they hold. To prescribe one forme for every man to follow, were too great presumption and folly: for every man will please his owne fancie . . ."

A garden to suit your purpose, your limitations, and your taste—why not, in these days of crowded living conditions, a garden of herbs in a south window? If it fits your needs, it can be as much of a garden as several acres can be to a man whose needs require several acres.

Start with a pot of chives. Set a cluster of the small onion-like bulbs in a pot and—presto—you have succulent green leaves for soups, salads and omelettes. More subtle than onion, chive is wonderful in cottage cheese. Always cut chives with scissors to retain the flavorful juices which would be lost if the tubular leaves were chopped.

Parsley is more than a garnish. It is a basic seasoning for marinades of fish and meat. New potatoes with parsley and melted butter are delicious. Pot-up a plant from the garden in the fall and you

may snip fresh sprigs of this vitamin-packed herb for mid-winter dishes.

A window herb garden would be sad without thyme. Seeds germinate readily. Sow in sifted loose soil as the seeds are very fine. The chopped fresh leaves are delicious in fish sauces, stews, poultry, game, chowders, fricassees and with cheese.

Sweet basil is one of the ever popular culinary herbs. The seed germinates readily in a well-drained soil. Pinch out the top several times to produce bushy growth. The sweet, spicy flavor is excellent in cheese or tomato dishes and good in tossed salad, too. There is an old myth which says that stroking from a fair lady's hand preserves the life of basil and causes it to grow.

Sweet marjoram is beautiful to see and heavenly to smell, as well as flavorful. Mix the fine seeds with sand when sowing. Germination is slow and the seedlings require patient and tender handling until the true leaves appear. This herb adds much flavor to poultry stuffing and lamb, is delicious with mushrooms and is particularly good in a butter sauce for fish, with savory and parsley.

Some cooks prefer oregano (*Coleus amboinicus*) which is also called Spanish thyme, to sweet marjoram. Both react similarly as window garden subjects. Oregano with chopped sweet basil and a clove of garlic adds richness to a pizza and is a fine seasoning for meats.

Rosemary is a must in a window herb garden for it is perhaps the most enchanting of all herbs. Plants should be started from cuttings rooted in sand or water and if a generous amount of lime is added to the potting soil, this pungent, spicy plant will grow strong and handsome. By all means rub the breast of a roasting chicken or duck with rosemary, or try some in the stuffing.

Some cooks consider summer savory an indispensable ingredient of many dishes, but as this plant does not bear cutting back, it generally is not advisable to include in a window garden.

Culture

A good soil mixture for potted herbs consists of three parts loam to one part compost or well-rotted manure. The soil should be light and well drained. Be generous with the pot size and water regularly. If necessary, spray every three to four weeks with a nicotine insecticide which contains a soap spreader. Wash the plant thoroughly with the solution and let stand a few hours, then spray thoroughly with clear water to remove spray residue.

Use your herbs with imagination, and garden in some of the interesting hand-made clay pots if you can obtain them. You may have as much fun as you would in a conventional herb garden with brick walks, knots, and allées, and certainly you will have fewer backaches.

Herb or *erb?*

A simple four-letter word, *h-e-r-b* has been the cause of much discussion as to its pronunciation. In America one is often considered uncultured if he pronounces the *h*; in England he is apt to be branded a cockney if he drops the *h*.

Until 1475 the word was *erb,* both in spelling and in pronunciation. It came to England from the Latin *herba*, through the Old French *herbe* or *erbe*. At the beginning of the sixteenth century, the Latin *h* was re-attached to the word, but it remained mute until 1800. Since then pronunciation of the *h* has come into use; *herb* is correct in England. American usage still clings to the historical *erb*. Take your choice. When in London, say *herb*, when in New York, say *erb*; when in Rome, . . .

THE MELTING POT

Old Herbs in the New World

Herbs have been tossed into the cooking pots of the world for many centuries—bitter herbs and sweet herbs, tangy herbs and fragrant herbs—all to make more palatable the foods of the world.

From Greece and Sweden, Holland and England, from France, China, Lebanon, Russia, Poland and Norway, and from Italy, Belgium and Armenia have come to America these uses of herbs in recipes old and new—herbs from the Old World rediscovered in the New.

ENGLISH

An autumn crocus for beauty and saffron cake . . .

SAFFRON CAKE

2 pounds flour
½ ounce yeast
1 pound butter
4 eggs
¼ pound Malaga raisins (seeded)
¼ pound currants
½ pound sugar
½ teaspoon salt
Saffron

Dissolve yeast in ½ pint tepid water and stir in sufficient flour to make a nice soft dough. Knead well. Cover basin and leave in a warm place to rise. When well risen, put remaining flour on a breadboard, make a bay in the center and put in butter, sugar and salt. Mix these together until smooth, then add eggs and the dough together with all the flour. Add the saffron liquor which has been made previously by infusing a pinch or two of saffron in ¼ pint warm water and strained. After thoroughly mixing, add chopped raisins and currants which have been dredged in flour. Turn into a well greased mould, or two smaller moulds, stand aside to rise. When dough has reached about twice its original size, bake in moderate oven for 1½ to 2 hours.

Saffron may be obtained from some herb shops or from a druggist.

Cakes for feasts and holidays seem to dominate my memories of English food. Shrove Tuesday was Pancake Day. On Good Friday we had Hot Cross and Saffron buns, and the famous Simnel Cake was eaten in mid-Lent on "Mothering Sunday."

What one did not know when enjoying Saffron Cake as a child, is that saffron is an orange coloring and seasoning product, consisting of the dried stigmas of the *Crocus sativus,* true saffron, and that it requires over 70,000 stigmas for one pound of saffron, making it a most valuable herb. Imported centuries ago supposedly in a Crusader's staff, it so flourished on the hillsides of Walden in Essex, that the town was renamed Saffron Walden.

The flower heads of the annual *Carthamus tinctorius,* safflower or false saffron, are often substituted and are used as a drug and coloring matter, and are far less costly.

The above must not be confused with the meadow saffron—*Colchicum autumnale,* from which an organic alkaloid known as colchicine is obtained.

NOREEN SHERIDAN CAPEN

NORWEGIAN

Uncooked fish with dill for an unusual cold dish . . .

GRAV LAKS

1 large trout or salmon
2 or 3 ounces fresh dill
Saltpeter, sugar, salt

Split fish lengthwise and remove all bones. Rub meat with small amount of saltpeter, sugar, and salt. Chop dill and sprinkle on fish. Put two sides together and let stand in a cold place for 5 to 6 hours; it is better after two days.

SAUCE

Make a mixture of sugar, vinegar, olive oil, French mustard, white pepper and chopped dill. Serve with "Grav Laks."

ODDVAR JOHANSEN

submitted through the courtesy of Mrs. Charles Ulric Bay (Josephine Perfect) wife of the United States Ambassador to Norway

LEBANESE

Thyme and sesame . . .

The Lebanese use thyme a great deal as seasoning. They are fond of mixing dried thyme with olive oil and eating it on bread, or a flat loaf of dough is saturated with an oil and thyme mixture and sent to the public oven to be baked. Thyme also is used in certain dishes where cabbage leaves are stuffed with a meat and rice mixture.

Sesame seed is commonly used in bread and cakes. Sesame is sprinkled thickly on the dough before the loaf is sent to the ovens. The seed sticks to the loaf and comes out nicely browned. Cookies are also coated with sesame seed.

A favorite summer salad of Americans, adapted from the Lebanese, is sliced cucumbers in water-thinned yoghurt with finely chopped fresh mint to season. Mint leaves are used often in mixed salads—with tomatoes, cucumbers, onion and green peppers; they add a cooling fragrance.

MARGARET BLISS LEAVITT
Beirut, Lebanon

CHINESE

Lycium seeds, from a Chinese variety of boxthorn . . .

SOUP CHICKEN WITH LYCIUM SEEDS

½ ounce *kau-kei-chi* (lycium seed)
3 pints cold water
3 pounds chicken (or 2 squabs)
½ teaspoon salt

Put lycium seeds, water, and well cleaned chicken into a medium large pot and boil over a low flame 1½ to 2 hours. The salt may be omitted if the faint sweetness of the lycium seeds is desired. When done, both the seeds and the chicken are good, in fact, very good.

枸杞子

kau-kei-chi

Lycium seeds as purchased are, in reality, dried scarlet fruits which contain the seed. They may be purchased at herb stores in most Chinatowns or at Chinese groceries. In Mandarin, they are called *kou-chi-tzu*, but the Cantonese pronunciation *kau-kei-chi* is more readily understood.

BUWEI YANG CHAO

POLISH

Chopped parsley and summer savory add delicious flavors to veal cutlets

CUTLETS JARECKA

1½ pounds veal cutlet
1 teaspoon salt
Flour
¼ cup butter
½ cup peas
½ cup string beans, cut
½ cup carrots, sliced
1 tablespoon chopped parsley and/or
½ teaspoon summer savory
3 anchovies
1 cup sour cream

Cut cutlet into serving pieces, sprinkle with salt, roll in flour and pound with a meat hammer or edge of plate. Brown on both sides in butter and place in casserole. Add a bit of water to pan, loosening all brown particles and pour over meat. Cook vegetables until about half done in a small amount of boiling salted water, and pour over veal, with water. Add chopped parsley and/or summer savory. Wipe anchovies to remove oil, chop and add to casserole. Add sour cream. Either cook over low flame on top of stove, or in 350 degree oven, closely covered, about 30 minutes.

In Poland folklore abounds with tales of the spells and healing power of herbs. In ancient times when doctors were unknown in remote Polish villages and settlements, there was always some old *baba* or *dziady* who specialized in the mysteries of the lindenflower, shavegrass, madder, coltsfoot, the roots and barks of trees, the leaves of plants—from the mugwort to the lowly sage—the seed of the parsley, the berry of the prickly ash and even so-called poisonous growths, advisedly and in discreet quantities.

Thanks to such tradition, there remains today, when mystery and miracle have given place to the scientific search for fact, a precise culture in Poland of the healing plant. In the Ethnographical Museum at Kraków a complete and voluminous catalogue exists of herbalist lore, recipes and combinations with specimen packages of each variety, as they are known, selected and concocted by unlettered peasants.

LOUISE LLEWELLYN JARECKA,
reprinted by courtesy of
The New York Times

DUTCH

For a young princess, a soup with leaves of nasturtium . . .

PRINCESS BEATRIX SOUP

¾ pound leaves and stems of nasturtium, chopped finely
1 ounce butter
1½ quarts beef broth (or 6 bouillon cubes)

Simmer chopped nasturtium in the butter for 15 minutes, add beef broth and cook 20 minutes. Rub mixture through a sieve and thicken with a roux of butter and flour (2 tablespoons flour, 3 tablespoons butter). Just before serving, add a well-beaten egg.

A favorite of the eldest princess of the Netherlands, this soup can be made with Indian cress or watercress in place of the nasturtium; however, if you have nasturtiums in your garden, try it the Dutch way.

Hints From Holland

A glass of hot milk becomes more palatable with a pinch of vanilla (bean), anise or nutmeg.

A simple sauce for vegetables or boiled potatoes is sweet cream thickened with a beaten egg yolk and a few drops of lemon juice. Add some minced parsley and chives. Do not allow cream to boil as it will curdle.

ROSE SCHEEPERS

SWEDISH

Fennel and anise in a coarse rye-meal bread for the Smörgasbord . . .

RYE-MEAL BREAD

3 cups water
5 cups rye meal
⅓ cup shortening
1 cup molasses
3 yeast cakes
1 tablespoon fennel seed
1 tablespoon anise seed
1 tablespoon grated orange rind
1 teaspoon salt
4 cups flour

Bring water to a boil and pour it over the rye meal in large mixing bowl. Add shortening and molasses. Dissolve the yeast cakes in 2 tablespoons warm water and 2 tablespoons sugar. Pound the herbs in a mortar or crush them on a board. Grate the orange rind, or use finely chopped orange peel from which the white substance has been removed. When mixture is lukewarm, add yeast, herbs, salt, and 2 cups of white flour. This will make a pretty solid dough. Cover and set aside to double in bulk. Then pour it out on board and knead in remaining 2 cups of flour. Keep on working dough until it is smooth and shiny and no longer adheres to board. Divide in three parts and give another little tap before placing them in greased tins. Cover and let double in bulk once more. Bake 60 to 70 minutes with oven at 350 degrees. This is a simple recipe for three excellent loaves of bread—making it will hardly disturb your daily routine.

Anna Olsson Coombs

BELGIAN

Herbes d'anguille (eel herbs)—sorrel, parsley, sage, mint, savory, verbena for Eels *Au Vert.*

EELS *AU VERT*

2 pounds medium-sized eels
Herbs *d'anguille*
½ tablespoon butter
1 glass white wine
Lemon juice
Parsley

Skin eels and wash carefully, cut into two-inch pieces. Chop herbs *d'anguille*—sorrel, parsley, sage, mint, savory, verbena, with the sorrel dominating—and put in saucepan with the eels and white wine. Cook rapidly for about 15 minutes and add a tablespoon of butter mixed with a little lemon juice and finely chopped parsley.

TARRAGON VINEGAR

Clean fresh tarragon which preferably has been picked in dry weather. Place a large handful of the leaves, together with a pinch of salt, in a bottle of wine vinegar. Stopple it and leave it four or five weeks in the sunshine. Strain through finely woven cloth, filter or paper. If you wish to get results more rapidly, put the tarragon leaves in a stone jar and pour boiling vinegar over them while covered with a cloth. Strain two days later. One may add a pinch of peppercorn and two or three cloves per quart of vinegar.

Mrs. David M. van Buuren
Brussels, Belgium

GREEK

Thyme and coriander in an ancient dish from an ancient land . . .

MIMA

Beef, lamb, veal, ham or fish
Vinegar
8 tablespoons grated cheese
1 teaspoon dried thyme
1 or 2 coriander seeds
3 leeks
1 tablespoon poppy seeds
Currants or raisins
½ cup honey
Pomegranate seeds

Chop the meat or fish into small pieces. Use the heart, liver, other parts, and the blood if there is any. Season with a little vinegar, cheese, thyme and coriander seeds. Add leeks or onions peeled and browned, poppy seeds, raisins, honey and if obtainable, a few pomegranate seeds for an acid flavor; otherwise, use more vinegar. Wine vinegar is fine. Mix all with the meat or fish and cook slowly until tender in a heavy skillet over low heat. Serve in soup plates, with plenty of crusty bread and a mixed green salad.

from: *Good Food from the Near East*
Joan Roland, M. Barrows & Co.

In ancient Athens wreaths of parsley were worn to absorb wine fumes and to delay inebriation. Today the use of parsley is confined to cookery—alone, to flavor all eggplant dishes and combined with thyme and bay in soups and boiled meat.

Dill, another common herb of the past and present, is stewed with artichokes; bay leaves go into a pot of tasty squid, and sage is indispensable to a fine dish of mullet or porgy.

IDA THALLON HILL
Athens, Greece

FRENCH

Bay leaf, thyme, basil, marjoram with tomato paste and white wine to flavor rabbit—typically Gallic . . .

LAPIN SAUTÉ CHASSEUR

1 rabbit
3 shallots, chopped
3 cups white wine
1 cup water
Salt and pepper to taste
Tomato paste
1 *bouquet fleuri* (a bay leaf, thyme, basil, marjoram—sprig of each tied in a bunch)
½ pound mushrooms
Chopped parsley

Cut rabbit into small pieces, sauté in butter or lard until light brown. Sprinkle lightly with flour. Add shallots, well chopped. When flour is brown add wine and water, salt and pepper, a small amount of tomato paste and the *bouquet fleuri*. Never leave the *bouquet* in the pot for over ten minutes. Let simmer in pot or casserole for one hour over a low fire. Add mushrooms. Skim, and serve in casserole with a good quantity of chopped parsley.

Australian rabbits are obtainable from many freezer plants; they are much like the white meat of chicken.

This is a very succulent, delicious dish and is inexpensive. It should be served with French bread and a green salad accompanied by a good Bordeaux *chambres* (room temperature). Always serve this wine in a basket as it often has a sediment at the bottom of the bottle, which should be disturbed as little as possible.

HELEN DE C. LITTLE

ITALIAN

Marjoram and watercress with cheese and eggs—an Easter Day dish from Sicily.

SARVIATA

1 pound ricotta cheese
4 eggs
2 tablespoons sugar
½ bunch watercress
2 pinches marjoram or sage
2 tablespoons olive oil
Salt and pepper to taste

Cream the ricotta in a large bowl. Beat the eggs lightly, add sugar, salt and pepper. Remove stems from watercress, wash and chop leaves and add to the beaten eggs. Add egg and cress mixture to the cheese. Add marjoram and mix until smooth. Heat olive oil in large frying pan and slowly pour the mixture into it. Cook slowly over low heat until lightly browned; turn and brown other side. Cool. This is to be eaten as a dessert, though by omitting the sugar, it may be served as the main dish of a luncheon. Approximately four portions.

On Easter Day with the sound of Hosannas ringing in their hearts, Sicilian mothers made sarviata. Sarviata is dialect for *salviata,* meaning to season with sage or herbs.

The ingredients for sarviata were prepared the day before, on the Sabbato Santo. Freshly laid eggs were taken from under the hens—even the poorest Sicilian had one or two hens in his home.

Ricotta was bought at the general store. Watercress was brought in a net from the country by those who knew where it grew along the banks of streams.

One *sordo* (one cent) of sugar was purchased at the store. The salt was bought from the Trapanese, who came in his two-wheeled cart, crying "A half measure, *otto sordi* (eight cents)—who wants salt?" The housewives brought their cooking pots to carry away the purchase. Peppercorns were bought at the general store and pounded in a mortar with a pestle.

Marjoram grew wild and was gathered by men who worked in the country and brought it home to their wives, who washed and chopped the leaves. It was also sold in the open market by 'men of the country' for one *sordo* a bunch.

The olive oil, too, was from the store, whose owner was the 'Mother of Manners'; she called all her customers 'Little Cousin.' The poor brought along a drinking glass to get two fingers of oil, price one *sordo.*

Mrs. R. R. Aaronson
as interviewed by
Clementine Paddleford
New York Herald Tribune

ARMENIAN

Dill, parsley, mint and grape leaves with rice, from the ancient East . .

SARMA

1 heaping cup rice (not long grain)
1 pound chopped onion
½ cup olive oil
¼ cup chopped parsley
Chopped dill (fresh leaves)
Chopped fresh mint
½ teaspoon sugar
Juice ½ lemon
Salt and pepper to taste

Sauté chopped onion in the olive oil, combine with the remaining ingredients and roll in parboiled grape leaves. Arrange in deep pan in rows, crossing the sarmas in alternate rows or layers to allow free circulation of water while cooking. Cook slowly for two hours in 2½ cups water. Do not remove from the pan until cool.

Makrouhie Housepian

RUSSIAN

Sorrel in a holiday soup, finely chopped dill on vegetables . . .

EASTER DAY SOUP

1 quart beef stock
½ pound sorrel
1 pound spinach

Cook spinach and sorrel in stock, season to taste with salt. Purée and serve with a spoonful of sour cream and a sliced (or finely chopped) hard-boiled egg.

Serve boiled new potatoes with melted butter, sour cream and finely chopped dill leaves.

Dill is delicious used in place of parsley —finely chopped on meats and vegetables.

A good Russian borscht is always cooked with stalks of dill and a couple of bay leaves.

KYRA KOTSCHOUBEY

AMERICAN

Sorrel, sweet basil, burnet, fennel, and chives in a lightly tossed, crisp salad . . . Good anywhere at any time . . .

GREEN SALAD, KITCHAWAN

½ head of lettuce, cut in strips, shaved, or torn apart—save the small heart-leaves for edging
¼ head young green Wakefield cabbage, shredded
12 leaves sorrel—if large, cut in pieces, if tender and small, leave whole and use more
8 or 10 young spinach leaves
A handful of young tops of sweet basil—leaves stripped from stems
10 sprigs of burnet, pull leaves off the stalk
3 stalks each of young celery, fennel and lovage—all three or any which are available. Leaves and root can also be used
3 skinned tomatoes
3 or 4 young radishes
A bunch of young chives
3 or 4 stalks of parsley, chervil, cress, mustard. Leaves from a couple of stalks of tarragon, even if tarragon vinegar is used; fresh is better.

Wash, drain and keep all greens in icebox until salad is assembled. Toss greens in salad bowl and sprinkle a little dressing over them, tossing very lightly. Serve the French dressing in a separate bowl as more will be needed.

FRENCH DRESSING, GREEN POOLS

½ teaspoon salt
Black pepper (grind in a grinder—white pepper has no savor!)
½ teaspoon dry mustard
1 teaspoon paprika
1 tablespoon powdered sugar
½ cup cider vinegar
½ cup tarragon vinegar
1 cup oil

Mix dry seasonings in a shallow bowl using a wooden fork, beat in a little vinegar until well moistened; add oil drop by drop, beating constantly until well blended and the dressing acquires the consistency of mayonnaise. Then beat in the rest of the vinegar and the oil alternately until all is used. Add more of either if desired, according to taste or to increase the amount. If no fresh sweet basil is at hand for the salad, add dried and powdered basil (about a tablespoonful) to the seasonings in the dressing. I keep a clove of garlic in the jar with the dressing but do not allow it to fall into the salad bowl! If a toothpick is stuck through it, that catastrophe is not apt to happen.

ELIZABETH REMSEN VAN BRUNT

HARVESTING AND PROCESSING CULINARY HERBS

. . . for winter flavor

Sherman K. Hardy

THE harvesting and processing of herbs guarantees delicious summertime flavors in the dead of winter—one of the thrills that comes with herb gardening.

The use of the green herb during the growing season finds it at its best. However, for commerce and off-season uses, the herb must be dried. The proper harvest time is most essential, provided cultural practices have been adapted to the particular herb in question. In general, the herb is at its highest aromatic and flavor point just as it comes into bloom, and for a period up to mid-bloom. There are a few exceptions to this, such as sage which is apt to have a slight turpentine flavor while in bloom, and tarragon which should be harvested early in the summer. In northeastern United States the essential oils appear to be at their best before the full heat of the day. Such crops as basil and summer savory can be cut several times in a season if top-bloom shearing is done to prevent the setting of seed. The tonnage yield may be less under this method, but the quality of the leaf is better.

Proper drying is more a matter of adequate air circulation than of extreme heat. Fan-driven dry air of not more than 110 degrees (preferably 95 degrees) retains color and flavor bettter than a higher heat under stagnant air conditions. Darkness or protection from direct sunlight also assists in the retention of bright color.

After drying, the herb should be loosely packed in a container that is not airtight and then stored in a dry room. Changeable humidity is a threat to the keeping qualities of the dried leaves. They should be kept in an uncrushed condition until ready for use or bottling, as crushed leaves exposed to air rapidly lose potency. Broken oil cells allow valuable aromatic oils to escape. A product of good color without unsightly dark areas, caused by mould or too humid drying conditions, is desired. A high percentage of the desirable aromatic qualities as well as a bright and distinctive flavor should be retained.

With practice, the grower will discover the exact time and the ideal method to harvest and process each herb. Skillful treatment will capture a maximum of summertime goodness for wintertime flavoring and fragrance.

McFarland photo

Garden Sage (*Salvia officinalis*)

A CALIFORNIA HERB GARDEN

Phillip G. Deicher

Designed to harmonize with Chinese Modern in the home . . .

A UNIQUE hillside setting against the Sierra Madre hills in Southern California offers uncommon opportunities for the development of a modern herb garden with emphasis on background plants of oriental origin. The central motif is a stylized pattern of the lotus petal. The garden is so planned that the culinary herbs are nearest the kitchen walk—sweet, decorative and specimen herbs being placed elsewhere.

The accompanying plan is being adapted to the situation in the following manner: the north boundary of the 25-foot square herb garden is a steep bank pitched at almost a 75 degree angle; a wall of the house forms the east boundary which includes a narrow gravel terrace backed by a fourteen-foot window with sliding doors; the south line is to be defined by a low architectural glass wall, the focal point to be a small fountain flanked by dwarf and semi-dwarf bamboos and backed by a weeping willow; to the west, the planned point of interest is a small shrine backed by a central specimen golden-rain tree, flanked by Chinese fringe trees and flowering fruits. The plan itself indicates other details such as hillside specimens, espaliered

McFarland photo

Rosemary is a fine accent plant beside a small pool

McFarland photo

Crimson Mother-of-thyme (*Thymus serpyllum* var. *coccineus*)

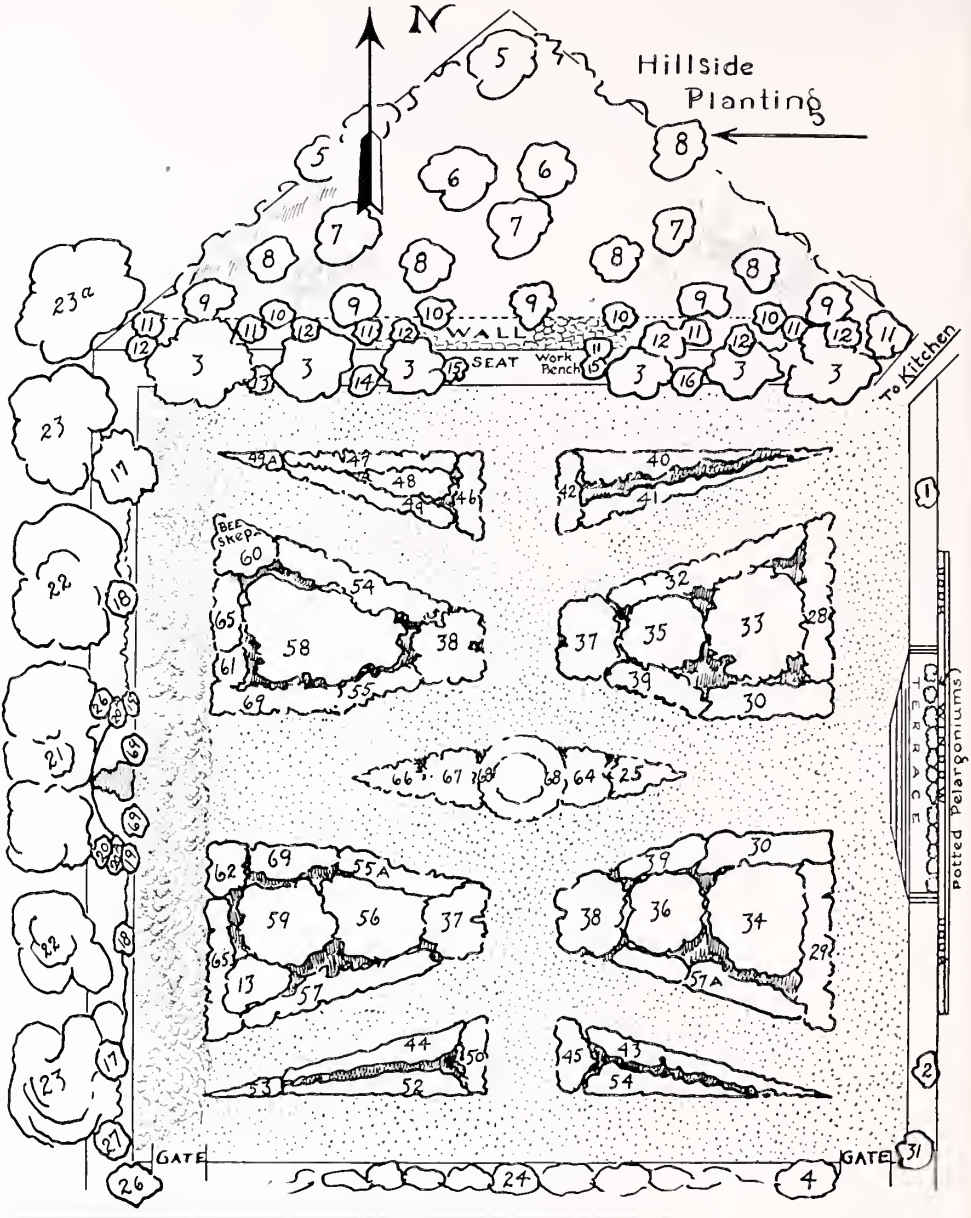
plants, a bee-skep near the angelica planting; a sun-dial in the center of the petal pattern, and a wide and generous bench at the hillside end to be used when sorting herbs or resting. One of the gates at the south end leads to the front garden, the other to the greenhouse and lathhouse area. Gravel walks are planned for all herb garden paths except the west walk (in front of the shrine). This entire walk is to be planted with trailing marjoram, which forms a soft thick mat after the first season.

Ground Covers

One of the most satisfactory of ground covers, especially for making garden paths, is trailing marjoram (*Origanum vulgare*). A few slips of it, or half a dozen potted plants, will spread sufficiently during one season to carpet a path fifteen to twenty feet long by three to four feet wide. As soon as well established—a matter of a few weeks under favorable spring growth—it flourishes best where trod upon. After two seasons, it is a resilient path of soft grey-green.

If allowed to clamber away from the path into the flower beds, trailing marjoram belies its trailing habit, sending up waving branches that soon shape into flowering heads—a development that never occurs when kept at path level. The blossoms are a rose-mauve, pleasantly blending with many other colors in the flower bed but is especially lovely among the clear blue of felicia or the lilac blue of the iris, San Gabriel.

Other good ground covers for California herb gardens are: rock candytuft (*Iberis saxatilis*), a low-growing (6 inches) perennial bearing umbels of white flowers; another candytuft often sold as *Iberis pinnata,* a cultivated form of *I. affinis*, grows to 16 inches but has a tendency to trail, making it useful as a hillside carpeting; some of the other marjorams, particularly *Origanum pulchellum* which is less than one foot in height



and has gray hairy leaves; one of the St. Johnsworts, *Hypericum olympicum*, a subshrub growing to one foot, and the rosemary variety Santa Barbara.

Mother-of-thyme (*Thymus serpyllum*) is the age-old favorite, as a ground cover. Fifty small divisions or well-rooted plants inserted into almost any kind of soil or even gravel will carpet an area around a sun dial to a yard's depth in one year. In late fall or winter, the foliage turns bronze—an interesting con-

PLANTS USED IN THE GARDEN

1. Japanese snowball, espalier—(*Viburnum tomentosum* var. *sterile*)
2. Evergreen pear, espalier (*Pyrus kawakami*)
3. Rosemary—(*Rosmarinus officinalis*)
4. Tansy—(*Tanacetum vulgare*)
5. Cherry-laurel—(*Prunus laurocerasus*)
6. Sweet bay—(*Laurus nobilis*)
7. Sweet olive (*Osmanthus fragrans*)
8. Hollyleaf sweetspire (*Itea ilicifolia*)
9. Natal-plum (*Carissa grandiflora*)
10. Borage (*Borago officinalis*)
11. Prostrate rosemary (*Rosmarinus prostratus*) var. "Santa Barbara"
12. Rock candytuft (*Iberis saxatilis*)
13. Pennyroyal (*Mentha pulegium*)
14. Apple mint (*Mentha rotundifolia*)
15. Bergamot mint (*Mentha citrata*)
16. Spearmint (*Mentha spicata*)
17. Hollyleaf cherry (*Prunus ilicifolia*)
18. Germander (*Teucrium chamaedrys*)
19. Germander (*Teucrium marum*)
20. Aralia (*Fatsia japonica*)

20a. Aralia (*Fatsia japonica* var. *moseri*)

21. Goldenrain-tree (*Koelreuteria paniculata*)
22. Fringe-tree (*Chionanthus retusa*)
23. Flowering peach, cherry, etc.
24. Willow and bamboo plantings
25. Creeping thyme (*Thymus serpyllum* var. *argenteus*) (silver-leaved)
26. Hoarhound (*Marrubium vulgare*)
27. Clary (*Salvia sclarea*)
28. Burnet (*Sanguisorba minor*)
29. Lemon balm (*Melissa officinalis*)
30. Lemon geranium (*Pelargonium limoneum*)
31. Sweet woodruff (*Asperula odorata*)
32. Early cress (*Barbarea verna*)
33. Nutmeg geranium (*Pelargonium odoratissimum*)
34. Peppermint scented geranium (*Pelargonium tomentosum*)
35. Garden salvia (*Salvia officinalis*)—var. "Holt's Mammoth"
36. Garden salvia, variegated (*Salvia officinalis* var.)
37. Marjoram (*Majorana hortensis*)
38. Lavender (*Lavandula officinalis*)
39. Winter savory (*Satureja montana*)
40. Chive (*Allium schoenoprasum*)
41. Parsley (*Petroselinum crispum*)
42. French sorrel (*Rumex scutatus*)
43. Hyssop (*Hyssopus officinalis*)
44. Hyssop (*Hyssopus officinalis*—var. *albus*) (white flowered)
45. Savory (*Satureja intricata*)
46. Basil (*Ocimum basilicum* var. *purpureum*)
47. Summer savory (*Satureja hortensis*)
48. Lovage (*Levisticum officinale*)
49. Bush basil (*Ocimum minimum*)

49a. Holy basil (*Ocimum sanctum*)

50. New Zealand brassbuttons (*Cotula squalida*)
51. Lavender—gray-leaved variety (*Lavandula dentata*)
52. Lavender—green-leaved variety (*Lavandula dentata*)
53. Roman wormwood (*Artemisia pontica*)
54. Basil (*Ocimum basilicum*)
55. Lavender (*Lavandula stoechas*)
56. Rose geranium (*Pelargonium graveolens*)
57. Lavender-cotton (*Santolina chamaecyparissus*)
58. Lemon verbena (*Lippia citriodora*)
59. Dyers woad (*Isatis tinctoria*)
60. Garden angelica (*Angelica archangelica*)
61. Costmary (*Chrysanthemum balsamita*)
62. Southernwood (*Artemisia abrotanum*)
63. Common wormwood (*Artemisia absinthium*)
64. Crete dittany (*Origanum dictamnus*)
65. Tarragon (*Artemisia dracunculus*)
66. Creeping thyme (*Thymus serpyllum* var. *aureus*) yellow-leaved variety
67. Thyme (*Thymus adamovici*)
68. Thyme (*Thymus pectinatus*)
69. Yerba buena (*Micromeria chamissonis*)

trast to the olive green of summer. In early spring, this "carpet" is a mottled pink because of the myriad of blossoms which last for two or three weeks, giving a dainty airy appearance to the ground covered. The varieties *T. serpyllum aureus*—leaves variegated with yellow, *argenteus*—leaves silver-variegated and a lemon thyme, *T. serpyllum* var. *vulgaris* or *T. citriodorus* are suitable to a California herb garden. Other useful thymes are: *T. pectinatus*—very fragrant, *T.*

adamovici, T. lanicaulis, and the varieties of common thyme (*T. vulgaris*).

It may sound like desecration, but in certain locations, the common spearmint or lamb mint (*Mentha spicata*) makes a most delightful ground cover. In a spot where moisture is sufficient, shade apportioned during part of the day, and where traffic is moderate, one may have the keen delight of treading a mint path and releasing that most refreshing of all herb scents to surround one at every step!

A ground cover which during spring months becomes a feature of interest in itself is woolly dittany, the dittany of Crete (*Origanum dictamnus*). With its fuzzy, round leaves and distinctly grey color accenting itself among the many green-toned herbs, its mounded forms readily cover bare ground wherever planted. Demanding neither good loam, nor moisture beyond what nature provides, its favorable growth may even be retarded by too much care. It is slightly aromatic, and its wire-like reddish stems which appear in early spring support dusty-rose flower heads that are reminding of miniature hop blossoms. Cut and placed without water in a Victorian vase, these flowering stalks will retain the color for several years. The stamens protruding saucily from the bracts of the flowers are white; they too, persist through the dried stages.

Other ground covers useful in California are: the prostrate speedwell (*Veronica latifolia* var. *prostrata*); sweet woodruff (*Asperula odorata*); *Lippia canescens,* a close relative to lemon verbena; yerba buena (*Micromeria chamissonis*), and Persian nepeta (*Nepeta mussini*).

Background Shrubs

Henry St. Johnswort (*Hypericum patulum henryi*) is a spreading evergreen shrub growing to 3 feet and having yellow flowers.

Rosy dipelta (*Dipelta floribunda*). A deciduous shrub similar to weigela, it grows to 16 feet, and bears pale pink fragrant flowers with golden throats.

Holly-leaf sweetspire (*Itea ilicifolia*) is a ten-foot evergreen, which has holly-like leaves and greenish-white flowers in foot long racemes.

Laurel or bay (*Laurus nobilis*) is the source of the bay-leaf much used in cooking. It is an evergreen tree sometimes reaching 40 feet in height, but many smaller shrub-like forms may be found.

Cherry-laurel (*Prunus laurocerasus*) is an evergreen shrub or small tree with fragrant white flowers.

Sweet olive (*Osmanthus fragrans*) a slow-growing evergreen, bears small white fragrant flowers.

Rose bay (*Rhododendron campylocarpum*) grows to 8 feet, has evergreen leaves 3 inches long and bears fragrant yellow flowers sometimes with pale crimson blotches.

Specimen Trees

Golden-rain tree (*Koelreuteria paniculata*) bears panicles of yellow flowers which are followed by interesting seed capsules. Grows to 30 feet.

Chinese fringe-tree (*Chionanthus retusa*), with its buoyantly green foliage and delicately patterned white flowers, is 20 feet tall at maturity. It blooms in 4 to 6 years from seed.

Basswood or linden (*Tilia henryana*) produces lush shade-foliage in summer. It grows from 30 to 50 feet tall.

Holly-leaved cherry (*Prunus ilicifolia*) is a shrubby evergreen tree to 30 feet. Its holly-like leaves are stiff and glossy and the small flowers are white.

Espalier Material

Japanese snowball (*Viburnum tomentosum* var. *sterile*) espaliered against a wall is a handsome plant with large round heads of white flowers.

Evergreen pear (*Pyrus kawakami*). Persimmon could have been espaliered here, but the pear was chosen because the colors of this garden are to be predominantly white, yellow and pale blue.

McFarland photo

Basil (*Ocimum basilicum*)

HERBS FOR FRAGRANCE

. . . scents from many lands

Helen M. Whitman
and
Joy L. Logee

HERB fragrance belongs to the Old World and is our connection to centuries long dead. Through these scents we may link ourselves with the ancient past—the magic, witchcraft, healing, cooking, drinking and superstition—the adventuresome search for spices and herbs in far lands. Ancient caravans winding through mountain passes, monasteries on sunlit peaks, gardens of cottage-dooryards, cloistered gardens and gardens drifting in terraces of color down Italian hillsides, patches of gray and green in an English paved and patterned close—all

come to mind with this fragrance of the past. Herb gardens are for dreaming, too. . . .

Balm (*Melissa officinalis*), a North American plant, has green scalloped leaves that when crushed emit a strong lemon fragrance.

Basil (*Ocimum basilicum*) from tropical Asia, Africa and the Pacific Isles, has a heavy, sweet scent and is probably the outstanding annual fragrant herb. The curly leaves of lettuce-leaf basil are remindful of green ribbon candy and are strongly fragrant of resin and spice. Lemon basil has a lemon-soap aroma. These seem to be varieties of bush basil (*O. minimum*).

Bedstraw (*Galium verum*) sometimes called yellow bedstraw and Our Lady's bedstraw, is from Europe but has become naturalized in America. According to Christian legend, this is one of the Cradle Herbs—was in the hay in the manger at Bethlehem. Later, in England, this plant was used for stuffing beds—'even by ladies of rank'—and indeed must have made a fragrant hay-scented couch.

Breath-of-Heaven or African heather (*Diosma ericoides*) from South Africa is an enchanting little shrub. Its rather drab, heather-like foliage releases a fruit-like fragrance when touched or bruised. The cut foliage adds much to the herb bouquet and when dried can be used for potpourri or for linens, as it holds the refreshing spice and pine odor for some time. This plant is not hardy out-of-doors in the Northeast so should be wintered indoors in a pot, but in the South and in Southern California it is much used as a garden plant. Pruned heavily in the spring months and given the proper dry season in the fall, it will come into bloom in early February. These plants, where hardy, are best treated as a heather in an acid soil of sand, humus, leafmold or peat.

Golden currant (*Ribes aureum*), a six-foot shrub from the West Coast, is lovely with its thick clusters of lemon-yellow flowers. The spiciness of the blooms is cast into the surrounding air; it is a mingled scent of cinnamon and clove, good in the herb garden.

Another fragrant herb is the delightful fruit-scented daisy (*Phagualon rupestre*) from Asia Minor and the shores of the Mediterranean. The plant makes a bushy growth to about 12 inches. The leaves are lance-shaped and slightly toothed, wavy edged, of a beautiful silver grey. The flowers are like the center of a daisy without the 'petals' (ray flowers). It can be grown as an annual and grows readily from seed sown in sandy, well drained soil. Seed should not be covered, as it is dust-fine. Plants can be trimmed or pruned to make a fine border plant.

Sweet geraniums (*Pelargoniums*) are myriad. Many came from South Africa. The peppermint geranium is the favorite in the herb garden, though the old rose geranium runs neck and neck for the place. Nutmeg, oakleaf, pheasant-foot, fernleaf, filbert-scented, lemon—all are strongly fragrant and different in form as well as perfume. All must be wintered indoors except in frost-free areas.

Perhaps the most fragrant of scented flowers and the most admired is the large, rambling royal jasmine (*Jasminum officinale* var. *grandiflorum*) from the Old World. Much cultivated in Cannes and Grasse, jasmine in full bloom permeates the air with a delightful fragrance. Its equal cannot be found in a perfume bottle. The vine grows to tremendous size under glass and is grown in the open in the South. The plants are pruned twice a year, early in the summer for fall blooming, and at the first of the year for Easter flowers. It is very difficult to propagate this jasmine from cuttings. One method is to layer the end shoots of the half hardened wood in peatmoss or sand near the large vine. It requires from two to three months for these to take root, when they can be cut from the main vine stem and potted. Use a medium heavy soil, and when well established a top dressing of well decayed cow manure will produce a wealth of bloom.

Louis Bunte p

Lavender at its best—at the top of a low wall

It is an excellent subject for the sunny window, but care must be taken to wet the foliage as often as possible to discourage red spider and mealy bug.

Lavender (*Lavandula officinalis*), with grey foliage and purple or lavender blooms in spikes, is probably the best known fragrant herb. Its odor is clean, and reminds one of grandmother's linen closet and her smelling salts. There is a fabulous white lavender, and a pinkish variety, also a tender *Lavandula dentata*, blooming well as a house plant—all with the same typical fragrance. The lavenders are native to the Canary Islands and from northern Africa to India.

Lemon verbena (*Lippia citriodora*) from Argentina and Chile, is a favorite, and the clear lemon scent is one which all visitors enjoy. Mixed with lavender in bags, it imparts a fresher tang to the fragrance of the dried lavender. It is always a welcome addition to potpourri and to bouquets for the blind and the sick. Steeped in rubbing alcohol, the fragrance lingers after massage.

The mints are many and almost all of them are extremely fragrant. Peppermint has a peppermint-candy fragrance. Spearmint is the mint for juleps, for lamb sauce, and for iced tea. Corsican mint resembles a close-growing moss and has a powerful fragrance reminiscent of *Crême de Menthe*. Apple mint and orange mint, orange peppermint, anise mint, pineapple mint—all are richly scented.

Pennyroyal (*Mentha pulegium*) is a perennial. The wild American variety called mock pennyroyal (*Hedeoma pulegioides*) is a good substitute and will scent the garden with its self-sown plants, to release their mosquito-repellent fragrance around the weeder's feet. It can generally be found in almost any patch of dry woods.

From the Mediterranean came sage (*Salvia officinalis*). The pungence of

McFarland photos

Rose geranium (*Pelargonium graveolens*)

Apple-mint (*Mentha rotundifolia*)

the leaves brings visions of sausage, goose and turkey stuffing to most of us. Pineapple sage (*Salvia rutilans*) is a native of Mexico, but in the East it is a marvelous house plant with delightful firecracker red blooms. It smells strongly of pineapple—the leaves are fine in iced tea or lemonade—and is grown easily from cuttings rooted in damp sand or water.

Mother-of-thyme (*Thymus serpyllum*) from Europe, Asia and North Africa, is a creeping plant with pinkish lavender bloom, pungent when trodden upon and fragrant as a mat for sitting.

Violets are important among the perfume-bearers of early spring, and again in November. They waft a delicious air to one entering the herb garden. Our native blue violets are prolific and lovely in blossom but have little fragrance. Sweet violet (*Viola odorata*) is best for perfume. It is purple, single and long-stemmed. The double variety is not usually hardy north of Philadelphia.

Honeysuckle (*Lonicera,* in many varieties) is well known both in America and in England and on the Continent for its sweet and pleasant scent. It is one of the famous old medicinal herbs, deserving a place for its virtues as well as its fragrance in or about any herb garden. The Italian honeysuckle (*Lonicera caprifolium*) and the English wild honeysuckle (*L. periclymenum*) which is sometimes called woodbine, are mentioned in the old herbals as a cure for asthma, hiccoughs and other diseases of the lungs and spleen.

There are many other plants whose fragrance is welcomed in the herb garden; the gardener will soon find his favorites. Why wait to build the herb garden as such? A fragrant plant or two in the perennial border can be exciting. A sprig of mint crushed to release its sweet scent, a delicate leaf of dill plucked from the plant for its tangy freshness, lemon verbena for a cooling fragrance—these plants add a note of surprise to a garden tour.

HERBS FOR COLOR

. . . highlights in the herb garden

Eleanour Sinclair Rohde

MANY folks regard the herb garden as an essentially green garden having little color. Some of the herb flowers are among the richest in color of all garden flowers. The blue of anchusa rivals that of the finest blue delphiniums. The dainty flowers of borage are an exquisite blue, and not to be overlooked is the lovely sky-blue of succory.

The bergamots have a glorious range of color from scarlet through mauve, pink and creamy-white. The rich scarlet of the old Scarlet bergamot and its newer counterpart, Cambridge Scarlet, is perhaps one of the best reds of the garden. These are varieties of *Monarda didyma*. Salmon Queen is a recent introduction of horticultural merit. Some other varieties of *M. didyma* are: *rosea* having magenta flowers, *kalmiana* with deep crimson purplish flowers, and *alba* which is white. The wild bergamot of American woodlands (*M. fistulosa*) has gray-mauve flowers which are lovely when grown near the pink varieties. The most attractive pink bergamot is *M. pectinata*, sometimes called lemon-mint. It has red-tinged foliage and gives off a peppery-lemon scent. A lower-growing bergamot with white flowers is *M. fistulosa alba* which has to be grown in masses to make the best display. It makes a charming edging plant to show off the colors of the other bergamots.

Bergamot is so named because the fragrance of the leaves and flowers is similar to that of bergamot-orange (*Citrus bergamia*) which yields an oil much used in *Eau de Cologne*.

The blue star-shaped flowers of borage (*Borago officinalis*) have great character with their prominent black anthers. In the herb garden, borage associates well with balm and horehound. The lush foliage of balm contrasts well with the bristly leaves of borage, and the habit of growth of horehound is a good foil for both.

Borage flowers figured very often in Tudor and Stuart needlework. Parkinson says, ". . . they have alwaies been enterposed among the flowers of women's needleworke." Embroiderers worked from the fresh flowers gathered from their own gardens. Borage is a humble looking plant, yet such are its virtues that John Evelyn said it "would revive the hypochondriac and cheer the hard student."

Anchusa brings a welcome blue to the herb garden. Sometimes called bugloss or alkanet, the showiest species is perhaps *Anchusa azurea* which grows to 5 feet in some regions. There are several horticultural forms such as Opal, Perrys, and Pride of Dover. Dropmore is probably one of the best; its leaves are hairy and silvery-green and the brilliant blue flowers are borne in racemes on branching stems.

Anchusa associates well with fennel for when the former's flowering period is over and it looks untidy, the widely spreading stems of the clumps of fennel hide the gaps.

Succory (*Cichorium intybus*), also well known as chicory, is one of the most charming of the blue-flowered plants. The petals of the daisy-like flowers are the color of a clear summer sky. This beautiful herb should be grown more often in the herbaceous border for it provides a lovely blue at a time when color is scarce. The flowers close in the early afternoon no matter how sunny the day.

The stately herbs make a splendid background for the herb garden. Angelica (*Angelica archangelica*) is a stout biennial or perennial that sometimes reaches 6 feet, though in colder regions is usually lower-growing. It is one of the few

Elecampane (*Inula helenium*)

McFarland photo

scented plants native of northern parts of Europe. With its handsome foliage, large flower heads, and rather spreading habit, angelica is a very stately addition to the herb garden.

Elecampane (*Inula helenium*), one of the stateliest of the herbs, is thought to be named for Helen of Troy. It attains an even greater height than angelica, and with its vivid yellow flowers measuring 4 inches across and its handsome leaves often 18 inches long, is delightful to associate with the deep blue of monkshood and the pink tones of acanthus.

The Vatican clary (a *Salvia sclarea* strain), though it does not attain the height of the other stately herbs, is highly decorative. This came from the Vatican gardens. The plants have woolly silvery-green leaves of great beauty and the flower stalks are 3 feet tall and covered with showy whorls of lavender-pink and white iridescent flowers. It flowers from mid-June until early October.

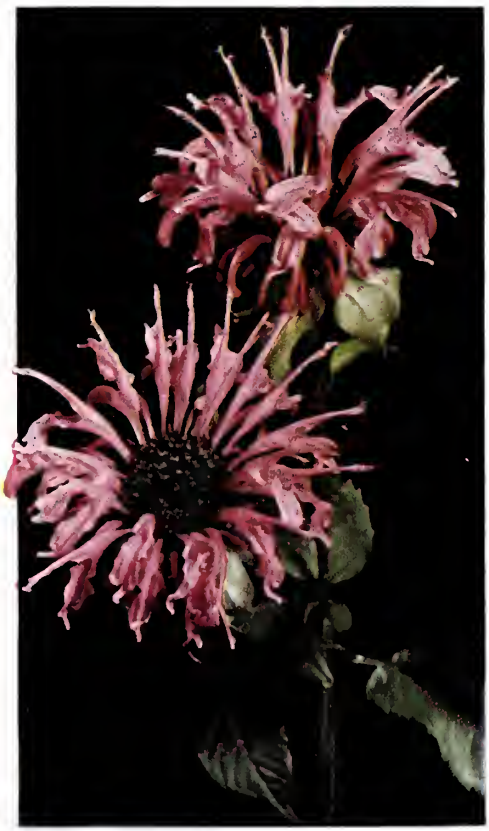
The herb garden need not be all gray-green. Color gives life, form adds interest, and fragrance adds joy. The herb garden need not be dull.

Foxglove (*Digitalis purpurea*) is a handsome plant from the Old World. Its leaves are the source of the important cardiac stimulant—digitalis—which is used in great quantities in modern medicine. Death can result from eating the foliage.

Sweet Violet (*Viola odorata*) a white variety.

Violets for fragrance, Bee-Balm for hummingbirds, Monkshood for clear blue spikes of color—all belong to the herb gardens of the past. Violet leaves were added to salads and custards and were attributed with curing sore eyes and falling fits. Leaves of Bee-Balm, or Oswego-tea, have the fragrance of the mints, and were used for tea. The powdered roots of Monkshood were used for poisoning rats and other pests; the foliage also is poisonous.

Bee-balm (*Monarda didyma*) variety Croftway Pink.



Monkshood (*Aconitum napellus*)

In the Middle Ages Betony was considered a cure for many ills —frightful visions and dreams, fear, aching ears, toothache and drunkenness. Betony tea as a cure for nervous headache is more modern. In parts of Europe the dried leaves are smoked in place of tobacco. Cottage Pinks, for fragrance alone, belong in the herb garden. Brought to Europe by the Crusaders, this plant was credited with healing powers because of its clove-like scent.

Betony (*Stachys grandiflora*)

Cottage Pinks
(*Dianthus plumarius*)

Pot Marigold (*Calendula officinalis*) is a popular annual plant even today, but for many centuries it doubled as a culinary and as a medicinal herb to cure pestilence, poisoning, scabs on the head and angry words.

Bugloss (*Anchusa azurea*) Anchusa is from the Greek, meaning "paint for the skin." The red dye obtained from the roots of this plant has been known in the field of cosmetics since early times.

HERBS IN THE DESERT

. . . it can be done

Janet Wright

A MISCELLANEOUS collection of sweet and culinary herbs is planted in a California desert as a part of the landscaping plan and as a small source of supply of herbs for the chef of Apple Valley Inn. Planting took place in late June and early July, 1949. A north wall, an east wall and a low, approximately six-foot slope of ground enclose this planting on three sides. To the west the ground is open. After about nine o'clock in the morning, the entire area is in full sun for the rest of the day, the slope being barely shaded in spots. The planting was done largely over a period of three days, beginning just after dawn and until about 11 a.m. when the heat became too intense for working. Then after a respite until about 5 p.m., further work was done until dark. Each plant was individually puddled in with a solution containing the "Plant-Chem" preparation in solution, plus dissolved Vitamin B^1 plus, in tablet form. About eight hundred gallons of the solution were used, both at the time of planting and the following day to water the herbs again in their beds.

After a year's time, a check has been made and notes on the hardiness of the various plants have been tabulated. The herbs and other plants lost include three geraniums (rose, skeleton-rose and peppermint), dittany (*Origanum dictamnus*), and trailing rosemary (*Rosmarinus officinalis* var. *prostratus*). The geraniums apparently froze during the winter; no conclusion is made about the dittany; the trailing rosemary plants were uncommonly small and it was found later that the individual puddling was not done as thoroughly as with the other material.

The herbs originally planted are: burnet, chives, costmary, lavender, lemon verbena, the mints—apple-mint, bergamot-mint, lamb-mint, peppermint and wooly apple-mint, oriental garlic, rosemary, rue, sage (Holt's mammoth, black and variegated), lavender-cotton, common wormwood and Roman wormwood.

The survivors, in order of their hardiness, having come through the first summer when temperatures went as high as 110 degrees and the first winter with temperatures as low as 10 degrees, are the following:

Lemon verbena—wholly intact, and flourishing. The original planting was done when the daytime temperature reached 104 degrees. No wilt was noted at any time, although the plants were in full leaf at time of planting and some beginning to show blossoms. They are planted along the north and east wall, which may have some bearing on the plants surviving the severe winter temperatures. There must be some heat available from the walls at all hours of day and night, from inside, and from sun-warming and reflection held over during at least part of even a winter night, since the sun is so intense. The fragrance and pungence of the lemon verbena leaves is far more pronounced and delicious a scent than that of any other plants with which the writer has had growing experience.

Tarragon—planted along the west (kitchen) wall, the growth is more lush than has ever been noted in any planting the writer has seen, or made, in Southern California. It is constantly cut by the chef, and perhaps this is a beneficial stimulation. The flavor is excellent.

Oriental garlic—slightly diminished because the manager became very fond of it and when he left took some with him for planting in his own garden! In excellent condition.

Common wormwood—in a year's time, it has covered an area measuring roughly 5 or 6 feet in diameter. Beautiful, clear, clean gray foliage; heavy scent.

McFarland photo

The lavender-tinted flowers of Chives add charm to any garden

Roman wormwood—equally healthy; growing well in its own proportions.

Sage—of the three (Holt's mammoth, black, variegated) the black seems to have made the most attractive and vigorous growth, though all are in very good shape.

Rue—in good shape, blooming freely in early June of the second year. In fact, the bloom is so vigorous that the foliage is less attractive than in cultivated gardens where more moisture is available and where stalks with spent flowers are often cut, stimulating foliage growth.

Lavender—no blossoming report as yet. Two or three specimens apparently were lost over the first season, due to perhaps two reasons: 1) some of the original plants were possibly too young for planting out in such rigorous climate; 2) watering was somewhat irregularly done and plants with such needs appear to have suffered. *Lavandula dentata* suffered even more.

Rosemary—a border planting is slightly decimated, due to conditions mentioned regarding the lavender plants. But the plants that survived are in good condition, with dark, healthy foliage in June. No report is available of the winter blooming season. No uncommon size has been reached over this first year, for either the rosemary or lavenders, but they appear to be in good sturdy health.

Lavender-cotton—no uncommon growth proportions. The clumps are compact, and pungence is heavy.

Costmary—small, compact growth, rather than the sprawling growth noted in cultivated gardens with more moisture. Pungence is heavy.

Chives and burnet—both inclined to flower to the disadvantage of the foliage.

The mints deserve special mention: they have been carefully divided by the gardener in charge who is proud to have 6 different kinds of mint at hand. The lamb-mint far outranges the others due to his special care and propagation of much of it for the use of the chef and his cohorts who are asked to supply it all summer for mint juleps! All plants were in good shape in mid-June, and the gardener reports them to be satisfactory during the time of year when mints show growth.

The watering program, carried on by disinterested helpers at times, may have some bearing on the success, or lack of it. But on the whole it would seem that herbs such as named above *will* grow successfully in desert lands with careful cultivation and care.

HERB TEAS

. . . from the garden, woods and meadows

Helen M. Fox

IN olden days tea made from the leaves of the tea plant from China (*Thea viridis*) was a luxury. The majority of people drank teas or infusions, as they were called, made with flowers, leaves, young twiggy growth, or from the bark of branches and roots gathered from plants which grew either in gardens or in nearby woods and meadows. Collecting plants from the wild for infusions was a pleasant excursion, while harvesting them from the garden was a joy, as is all handling of these fragrant plants.

There are stories about each of the native herbs in the diaries and accounts of the first explorers, missionaries and settlers. Tales about old world plants are to be found in herbals.

The infusions all have some effect on the man who imbibes them. Some are known to be quieting, some mildly laxative, many of them astringent and a few when indulged in to excess are poisonous. Not any of the herbs mentioned in this article are poisonous.

Almost every family and country has its favorite infusions for different ailments and states of mind, and frequently these are blends of several ingredients. The Chinese add jasmine flowers, rose petals, litchi or dried chrysanthemum petals to their teas. In the United States we like iced teas flavored with mint, lemon and sugar to which I add orange juice.

A pleasant drink is made of China tea with balm, cloves and lemon. The balm leaves give a smooth flavor and an undertone of lemon, quite different from the flavor imparted by mint. Leaves of pineapple sage added to those of balm and mint make a good cold drink and the same leaves also provide an excellent flavor to a bland jelly, like crab-apple. Rosemary flowers and leaves mixed with those of lavender are said to restore the appetite.

It seems best to arrange the herbs for infusions in a list, each accompanied by a brief commentary. The material has been gathered from my own experience and years of study and checked with Elias Yanovsky, Food Plants of the North American Indians (U. S. D. A. Misc. Publ. 237: 1–83. July 1936), The Merck Index and The United States Dispensatory, Osol-Farrar.

Herbs

Balm, or lemon balm (also called: sweet balm, money plant, dropsy plant and cure-all) (*Melissa officinalis*), shows by its many common names how popular and useful it has been. It is a south European plant naturalized in the United States. A few leaves in iced water are pleasant and a bunch steeped with fruit juices or with hot Chinese tea imparts a pleasant slightly mint-like and faint lemon flavor. It was given as an infusion for patients ill with colds and promotes perspiration.

Beard-tongue (*Penstemon confertus*) is native to the Northwest. British Columbia Indians drink an infusion made from its dried leaves and stems.

Costmary, alecost or bible-leaf (*Chrysanthemum balsamita*) is a European plant now and then escaped from gardens in this country. A weak infusion of the leaves is pleasant, but a strong one is bitter.

Coreopsis (*Corcopsis cardaminefolia*) is an annual to 2 feet high, native to Kansas and Arizona. It furnishes a beverage to Zuni Indians.

Lavender (*Lavandula officinalis*), a south European plant, is recommended by some to be infused but the scent is almost too closely associated with perfume to be attractive as a drink. It

Self-heal (*Prunella vulgaris*) —'the herb that healed the wounds of 40,000 warriors!'

Roche photo

would seem best to use it similarly to rosemary, namely in a blend.

Lemon verbena (*Lippia citriodora*), from Peru, has a faint flavor of lemon when used alone in an infusion but blends well with other herbs.

Yellow loosestrife (*Lysimachia quadrifolia*) is native from Canada to Georgia and Tennessee. The leaves are used.

Oswego-tea or bee-balm (*Monarda didyma*) is a native plant infused by the Oswego Indians. It has scarlet flowers. There are varieties with rose, purple, salmon, pale pink and also crimson blooms. Bergamot (*Monarda fistulosa*) is also a native plant and has pale lavender flowers. An infusion of its leaves is taken by the Indians to allay abdominal pains. Both plants yield thymol used in medicine. The drink from them is only fairly tasty.

Peppermint (*Mentha piperita*), spearmint (*Mentha spicata*). Almost any of the mints make delicious tea, the medicinal and healthful value of which cannot be doubted when one reads in a book on plants published in 1694 that the mints abound with 'a Subtil Sulphur which de-

Yarrow (*Achillea millefolium*) said to be named for Achilles who applied it to the wounds of his soldiers

Roche ph

stroyeth Acids.' The infusions act as a slight stimulant and may relieve colic and convulsions. Peppermint is particularly helpful to allay indigestion and is the most palatable of the mint teas.

Rosemary (*Rosmarinus officinalis*), a south European plant, has a strong distinctive taste and is best as one of a blend in infusions. Today it is used in toilet waters.

Sage or pineapple sage (*Salvia rutilans*) comes from the Southwest and garden sage (*Salvia officinalis*) from Europe. Both are infused. The garden sage is said to be astringent and tonic. A little annual sage, *Salvia columbariae*, from California and northern Mexico, sometimes is called Chia. Its seeds are roasted and ground (or not) and made into a drink by the native Indians. The seeds swell in water and make a mucilaginous, palatable and nutritious drink.

Self-heal, heal-all, or carpenter weed (*Prunella vulgaris*) is naturalized in the United States. It is infused by the British Columbia Indians and taken for its medicinal effect. Formerly used in hemorrhages and diarrhea and, with honey,

as a gargle for sore throat. It was the famous herb used by Alexander the Great to heal the wounds of 40,000 warriors! It is a useful wild plant, and worth keeping where it springs up near the house or garden, as the juice of its leaves applied to a sudden cut or scratch will stop bleeding at once and aid in healing.

Sweet goldenrod and Blue mountain tea (*Solidago odora*) from eastern North America, are popular names. Goldenrod was introduced into England by the Crusaders from Asia, but we have our own native varieties. The leaves of at least one variety are pungent, and from them an anise-like oil is expressed. An aromatic tea which is pleasantly stimulating also is made from the leaves. One of its common names, woundwort, suggests its healing value. The botanical name, *Solidago,* is from the Latin *solidare,* meaning to unite.

Sweet vernal grass (*Anthoxanthum odoratum*), a perennial, is one of the plants which scents meadows in early summer. However, it imparts a bitter flavor to hay and is rather unpalatable to cattle. Its name of 'Holy Grass' arose from the custom of strewing it in the aisles of churches on holy days. In Sweden it is often hung over the head of a bed to induce sleep. The sweet fragrance is due to benzoic acid, and the flowers (dried) contain coumarin used in flavoring and perfumery.

Thyme (*Thymus vulgaris*) is a European plant; its leaves are used for flavoring. The whole plant is highly aromatic and yields thyme oil. It is probably a good plan to use thyme leaves with other herbs in a drink. Alone it would be too strong but would provide a spicy flavor for meats and soups. Infusions are made from the leafy tips.

Yarrow (*Achillea millefolium*) is naturalized in the United States. The whole herb is used, sweetened with honey. Flowers in an infusion have a mild effect to increase perspiration. The whole herb infused may allay hemorrhage.

Wild marjoram (*Origanum vulgare*) is a popular tea in Kent. It is a mild stimulant and tonic and alleviates nervous headaches. It is also used to induce perspiration at the beginning of a case of measles—to bring out the spots! Another remedy for measles is saffron tea (from the *Crocus sativus*), suggested recently by the ancient gardener of a friend whose child was sickening with a case. "Wrap her up warm in a woolen blanket," he advised, "tuck her in a big chair before the fire and give her a cup of saffron tea with honey, and she'll be over it the quicker when the measles pop out." A tea of wild marjoram is taken as a sedative to prevent seasickness.

Yerba buena (*Micromeria chamissonis*) is a small leaved, herbaceous vine which roots at the tips and has small white flowers. The leaves have a lemony, pennyroyal sort of fragrance, and can be used in a tea that is said to relieve colic and to purify the blood. It was used by the early Spanish settlers in California. They learned of its use, no doubt, from the Indians of Southern California. Yerba buena is native to the Pacific Coast and is as beloved there as the trailing arbutus is in the East, according to Louise Beebe Wilder.

The Herb Society of America

This organization, founded in 1933, brings together the herb gardeners of America. The main office is in Boston—300 Massachusetts Avenue, Boston 15,—but there are many regional groups throughout the nation which meet often.

A national meeting is held annually. Members in the Society maintain a herbarium in Boston and carry on research in uses, culture and history of herbs. The regional units publish many bulletins and "The Herbarist" is published once a year from the national headquarters.

Bay trees lend a classical note to a formal garden

McFarland photo

THE NOBLE LAUREL

Bay leaf, the sometimes indispensable ingredient of a really good soup, has known more aesthetic uses in ages past. This, the true laurel (*Laurus nobilis*), was the laurel of the Greeks and Romans. To be crowned with a wreath of laurel was an honor accorded only to the greatest heroes and poets. Even today the title, *Poet Laureate,* is one of high distinction in England. *Baccalaureate,* pertaining to a bachelor's degree, is thought to have come from the idea, "under the influence of laurel." To 'bask in one's laurels' or to 'rest on one's laurels' are clichés much overworked.

In Greece sweet bay or laurel sometimes reaches 60 feet in height and is a handsome tree with luxurious evergreen leaves. It is grown as a shrub or small tree in England and southern United States but is not hardy north of the Carolinas and Georgia. Protected, in the North, it grows well as a tub plant. A sunny position from April to October makes the bay a welcome addition to the herb garden. The plant will stand slight frost, but in winter it should be kept in a shed, deep pit or heavily shaded greenhouse where a temperature between 38 and 45 degrees is maintained. Bay dislikes dry heat, therefore is not good as a house plant. A potting mixture of 2 parts sharp sand, 2 parts loam, 2 parts peatmoss, one part cow manure is best. Water generously during the growing season, and do not allow the soil to dry out completely even in winter.

Germander (*Teucrium chamaedrys*) an outstanding plant for hedges and edges

McFarland photo

HEDGES, EDGES AND ACCENTS

. . . plants vital to herb garden design

Elizabeth R. Van Brunt

EARLY fall is the perfect time for setting out some of the perennial herbs which will give strength and permanence of design to the herb garden.

The hedge defines the garden; it gives the herb garden a boundary and separates it from the outside world. The edging plant, be it rue, thyme, box, wall germander, chives or the lacy, gray-foliaged Roman wormwood, is a matter of preference, but to plant these in the fall is to be a step ahead of the spring rush. When spring comes, the garden already has form, and a base is provided for the planting of annual herbs. A garden with a definite pattern is much easier to keep in condition than an informal border. However, even a border may have a basic design, concealed though it may be.

There are several plants which may be used in the herb garden for hedges, edges and accents of a more or less permanent nature. Usefulness as herbs—either culinary, medicinal or fragrant—should be the criterion in selecting herb garden material. However modern interpretation of the term allows the use of plants which have passed from every day usefulness but which traditionally belong to the herb

garden. This allows greater freedom in selection, for in the past centuries thousands of plants were called upon to perform in cooking and curing and to ward off evil spirits both ethereal and bottled. Because of this great usage of plants in the past, the place of honor in the herb garden might be accorded to a sassafras tree or to a houseleek.

Hedges for Boundaries

Hedge plants are of primary importance according to the old writers, for a garden is only a collection of beds until it is enclosed from, 'diseases, insect pests, animals, boisterous blasts of wind, cold, weed, worms, moles, poysonful smoak and evil neighbors.'

A hedge of sheared yew or hemlock is a handsome background for any garden. Yew is, of course, a traditional plant to be used with herbs; hemlock is not quite as refined but a good second-best any day. Also hemlock is less expensive than yew —a fact of importance. Arborvitae is another evergreen which may hedge the herb garden, but it often discolors badly in the winter.

In the deciduous group, hawthorn may be grown to form a dignified and impenetrable enclosure for the herb garden. This is another plant of long reputation in English gardens. Privet is an old standby for a cheap, fast-growing hedge. It requires shearing several times a year to keep it in top condition.

Many of the old species roses may be used to advantage as informal hedges in the herb garden and are sometimes planted outside a low wall or fence to hang over into the garden. Sweetbrier (*Rosa eglanteria*) grows to 6 feet and has single pink flowers. The foliage has an apple fragrance which is especially notable after a shower. This rose has been closely associated with herb gardens in England where the young shoots were cut and prepared as a confection. Clip the hedge in very early spring. Other species roses which are good outside a low wall or fence, and which have fragrant blossoms are: *R. pomifera*, densely branched, 6 feet, deep pink flowers; Macartney rose (*R. bracteata*), a half-climbing rose with shining green foliage and lemon scented single white flowers; Redleaf rose (*R. rubrifolia*), especially valuable for its blue-green foliage which is tinged with purplish-red and its single red flowers; Scotch rose (*R. spinosissima*), grows to 3 feet and has several varieties, *alba plena*—double white flowers, *altaica*—pale yellow flowers 3 inches in diameter, *lutea*—Persian-yellow and *lutea plena* with mimosa-yellow double flowers. The Scotch rose is probably one of the easiest to grow and is very hardy. It is the only rose known to be native in Iceland.

Low Hedges to use Within the Garden

These plants may be sheared to severe, formal hedges where geometric garden pattern is important in maintaining the design.

Hyssop (*Hyssopus officinalis*) is a favorite hedge plant of many gardeners and grows from 18 to 24 inches in height. It is sturdy and foolproof, and it may be clipped or left to bear rich purple spikes of bloom. If cut back after the flowers have faded, hyssop often will bloom again late in the summer. Though some gardeners complain of the musky, skunk-like odor of this plant, it is not objectionable unless the foliage is bruised.

Lavender (*Lavandula officinalis*) is a popular plant for low hedges. This fragrant plant grows easily and well in the Middle Atlantic states if good drainage and a rather poor lime-soil are provided. Lavender does particularly well in full sun at the top of a retaining wall. Shade it does not love. This plant can be cut back severely at the time of harvesting—when the first bloom at the base of the flower spike opens. Some gardeners shear lavender into a neat low hedge, but it is attractive if left to its natural spreading habit.

Lavender-cotton (*Santolina chamaecyparissus*) grows to 12 inches and has been used as a compact hedge plant since Elizabethan days to contrast with the darker green of hyssop, rosemary, and germander.

Germander (*Teucrium chamaedrys*) is practically evergreen and is much used in the low hedges which form the patterns of knot gardens. This plant produces many offshoots and requires much trimming to keep it neat.

Roman wormwood (*Artemisia pontica*) with its soft feathery gray-green foliage is another low hedge plant which can be used to advantage for bordering beds or paths. Like lavender-cotton and germander, this plant can be severely sheared into a small, formal hedge.

Rosemary (*Rosmarinus officinalis*) is a good hedge plant in the southern regions, but cannot be depended upon for winter hardiness north of Philadelphia.

Box (*Buxus sempervirens*) is a wonderful herb garden plant where hardy. It often suffers from winter damage north of Philadelphia. The true edging box (*B. sempervirens suffruticosa*) is dense, slow growing and compact and is an ideal plant for edging beds and walks in the herb garden where it proves hardy. Littleleaf, Korean and Japanese box might be used in colder regions where *B. sempervirens* is of doubtful hardiness. These Asiatic types are varieties of *Buxus microphylla*. Box is a classic, time-ignoring plant which has, according to Oliver Wendell Holmes, "the fragrance of eternity."

Edges

These plants are usually informal in habit of growth. Some are very low growing, and some are over a foot tall. Edging plants help give structure to the garden, but perhaps more important is the fact that they are valuable where the softening of severe lines is desirable. Edging plants usually tumble out of the beds and are allowed to sprawl onto the garden paths.

Beach wormwood (*Artemisia stelleriana*) is also known as one of the dusty millers. Its white-wooly leaves and endurance in poor soil are hearty recommendations for this plant.

Chives (*Allium schoenoprasum*) will make a cheerful border of spikey green leaves and in July and August the large balls of dusty lavender blooms add a new note of color. Remember to cut back the chives after blooming for if seed heads form, the garden is apt to be overrun with this onion-like herb. It is well to cut back the leaves severely as succulent new ones will appear which are best in flavor.

Thyme (*Thymus vulgaris*) requires clipping to keep it neat, but otherwise is a desirable low edging plant of spreading habit.

Mother-of-thyme (*T. serpyllum*) is a prostrate subshrub. Several varieties of this are free-growing enough to soften the edge lines of walks or paths with their fragrant foliage.

Pinks are popular edging plants and are many in variety. Clove pink (*Dianthus caryophyllus*), Cheddar pink (*D. gratianopolitanus*), and a Cottage pink (*D. fimbriatus alba*) which has fine gray-green foliage and fringed flowers, and the variety Miss Gladys Cranfield which is pink with a red eye, are all good. The pinks are freely clove scented.

Lambs-ears (*Stachys lanata*), though flower stalks grow to 18 inches, is an attractive edging plant with gray wooly leaves.

Violets (*Viola odorata*) are handsome in leaf and as edging plants are useful. These plants were used in the early knot gardens of England. The spring flowers —either white or purple—are ever welcome, but this plant needs to be watched as it seeds itself prolifically if conditions are ideal. Violets are best in a heavier cool soil and in partial shade, so perhaps are limited as to their use in the herb garden, though traditionally they should not be omitted.

Swiss or alpine strawberry makes a charming edging and bears small sweet

Wormwood (*Artemisia pontica*. Good for low edge or hedge of contrasting foliage

Carlton B. Lees photo

fruit. Baron Sollemacher is a variety still available. These runnerless plants are particularly attractive.

Accents

Accents are the plants which add excitement to garden design, consequently they should be used carefully. Though an herb garden is exciting, it should not be riotous.

Some of the accents are trees; these are to give height and strength to the herb garden picture. They should not be placed where unwanted shadows will be cast, but, at the same time, the trees should be a part of the design. Other accents are low plants to be placed at the corners of beds or each side of a gate or entranceway to the herb garden. Some accents, such as the familiar hen-and-chickens, add interest when tucked between stone steps.

Southernwood (*Artemisia abrotanum*) was well known in the gardens of Colonial America as a doorstep accent. It is a woody shrub growing from 2 to 4 feet in height. It is best cut back in the early spring to prevent straggly growth. This misty, gray-green plant is lovely at a garden gate or at the corner of the herb-garden path.

Wormwood (*Artemisia schmidtiana* var. *nana*) forms a beautiful mound of silver-white silky foliage at the corner of a bed of herbs.

Winter savory (*Satureja montana*), a woody shrub of 18 inches, is effective at the corners of beds or as isolated features

in the garden picture. It can be severely cut back in the spring, or if heavily harvested, the resulting pruning will be sufficient.

Lady's mantle (*Alchemilla vulgaris*) grows to 15 inches. The gray leaves, borne on erect long stalks, contrast in color and texture to other herb garden plants.

Rue (*Ruta graveolens*) is a graceful plant with blue-green foliage which is delicately cut. A stronger plant is produced if seed production is prevented, so cut off all faded flowers. This plant is irritating to the skin of some people, but if care is taken, it can be included in the herb garden.

Trees and large shrubs are important to complete the herb garden in some instances.

Spice bush (*Lindera benzoin*), a small native tree, blends well with herbs for the fragrance of its leaves. It grows well in shade and moisture.

Sassafras (*Sassafras albidum*) is not of the easiest culture, but is a handsome tree ablaze with scarlet in autumn. This tree has a rightful place in the herb garden; the root-bark is of medicinal value, and in some localities is still in use—sassafras tea was a much used spring tonic.

American elder (*Sambucus canadensis*) is a coarse shrub which might be used for background planting in a large garden. Though it is weedy in growth habit, this shrub produces handsome flowers and edible fruit. Tradition says that all herbs were supposed to grow under the elder-tree-mother and would be more fragrant if one of these shrubs grew at each corner of the garden.

Hawthorn (*Crataegus oxyacantha*), the English may, makes a memorable spring picture especially if growing over a gateway to the herb garden. Shakespeare makes many references to hawthorn, and it appeared in English gardens for centuries. Other than its use as a hedge plant, this is probably *the* tree to plant in the herb garden picture.

Accents too are the roof houseleek or hen-and-chickens (*Sempervivum tectorum*) and the cobweb houseleek (*S. arachnoideum*) which has the rosette of leaves covered by cobweb-like hairs. These plants, growing on many of the thatched roofs of Europe, were believed to protect the house from lightning, and the fleshy leaves, crushed, relieved burns. Their right to a place in the herb garden is without challenge.

Tradition rescues a plant when lack of present day use rules it out of the herb garden. Herb gardening is for pleasure, for fun. Choose some good basic plants for pattern and design; in choosing others let conscience be your guide.

Louis Buhle photo

A clipped privet hedge enclosing a garden

The Architectural Acanthus

Capital of the Corinthian order of architecture showing the acanthus-leaf motif

Who has not seen the acanthus-leaf of the Corinthian column? It is of world-wide fame. In the years just preceding the Birth of Christ, the Greeks reproduced the leaf of their native acanthus in metal and in stone—mediums for architecture and sculpture. The acanthus leaf inspired the last of the three famous columns of Greek architecture. The Corinthian column so pleased the wandering Romans that they took it home to Italy to be copied and to be elaborated upon. From Rome the acanthus-leaf motif has travelled around the world, reproduced again and again in wood, stone, metal, concrete and plaster.

Horticulturally as well as artistically acanthus is a notable plant. A handsome addition to the perennial border or herb garden, acanthus grows to about 2 feet. The spike of curiously shaped flowers is rose-pink, white or lavender.

A rich, light, well-drained soil and much sunshine are the primary needs of acanthus. Excessive moisture—especially in winter or early spring—can be fatal to this plant. It is hardy in the New York area; sometimes the plant is deeply mulched for winter protection. Root divisions may be made in the spring, or plants may be raised from seeds.

Hegi's "Illustrierte Flora von Mittel—Europa"

Tomentose Rose (*R. tomentosa*)
Scotch Rose (*R. spinosissima*)

Field Rose (*R. arvensis*)
Dog Rose (*R. canina*)

SAVORY HERBS

. . . how to grow them

Carlton B. Lees

THE majority of herbs can be grown successfully under a wide range of soil and climatic conditions; from a California desert to northern New England they will thrive if given proper treatment. As a group herbs are a rugged lot.

An ordinary soil suitable to vegetable gardening is suitable to herb gardening. Compact, bushy plants are richest in the valuable essential oils and result in the most flavorful product; these are produced on soils not over-rich in organic matter. Light soil, good drainage and full sun seem to be the prerequisites to herb growing. Sage, thyme, parsley, chervil and the mints are best in a moderately moist situation, but good drainage is necessary none-the-less. Most herbs will not tolerate 'wet feet' though many seem to thrive on the poorest of gravelly soils. Some will grow in partial shade as do many of the mints. Herbs are not difficult to grow.

Herbs for the Beginner

For the beginner, the French *les fines herbes*—sweet basil, chervil, sweet marjoram, thyme, rosemary and tarragon—are suggested. Others, easily grown, are included for accent flavors and for subtle flavors.

PUNGENT HERBS

Rosemary (*Rosmarinus officinalis*): Fragrant perennial growing to 6 feet in the South, tender in the North. Evergreen, sometimes carried through the winter in a cold-frame in colder regions, or in a pot as a house plant. It is well adapted to the latter treatment. Grows in sun and in soil which is slightly dry, becoming leggy in soil which is too moist. Easily grown from cuttings in late winter or early spring. May also be grown from seed. This is a good hedge plant in areas where it is hardy.

Sage (*Salvia officinalis*): A shrubby perennial growing to 2 feet. Silver-gray, lance-shaped leaves and striking purple flowers. Propagate by seeds or cuttings. The seed should be sown thinly indoors and the seedlings transplanted to the garden when 2 or 3 inches tall. Seedlings are apt to produce plants of mixed types, so it is best to raise plants from cuttings of a desirable stock. Six or 8 inches of top growth may be harvested the first year, but do not cut-back late in the season as a full head of leaves provides winter protection.

Winter savory (*Satureja montana*): A perennial, growing 9 to 15 inches. Low and spreading, light green leaves—a very decorative plant. Sow seeds in May, or earlier indoors, and transplant to the garden when large enough to handle easily and the weather is warm. Also may be propagated by cuttings and root divisions. Grows in ordinary garden soil. A good border or edging plant also adapted to rock-gardens. Hardy.

HERBS FOR ACCENT FLAVORS

Sweet basil (*Ocimum basilicum*): A strongly aromatic herb, annual, growing from 18 inches to 2 feet. A compact plant with glossy, light green leaves, it can be grown easily from seeds sown where the plants are to grow after danger of frost has passed. Germinates in 5 to 7 days. A rapid grower in well drained soil and full sun. Leaves may be cut in six weeks; pinch tops early to promote bushy growth.

Dill (*Anethum graveolens*): An extremely fragrant annual, 24 to 36 inches

tall, of slender habit and delicate feathery leaves. Sow where the plants are to stand and thin to 6 inches apart. Does not transplant easily.

Mint (*Mentha* species): The perennial mints are all quite hardy and are of easy culture—sometimes fast-spreading by underground runners. Usually they do best in a moist cool soil and will thrive in partial shade. Propagated by cuttings of the underground runners or by root division. Some good varieties are: apple-mint (*Mentha rotundifolia*), 12 to 18 inches tall, American mint (*M. arvensis*) 18 to 24 inches, Corsican or creeping mint (*M. requieni*) 2 to 3 inches, curled mint (*M. crispa*) 18 to 24 inches, orange-mint (*M. citrata*) 12 inches, peppermint (*M. piperita*) 18 to 24 inches, and spear-mint (*M. spicata*) 18 to 24 inches. Corsican mint is good as a fragrant, low-growing groundcover.

Sweet marjoram (*Majorana hortensis*): Perennial cultivated as an annual where freezing temperatures occur. Of spreading bushy habit with dull green leaves, it may be propagated from seeds, cuttings or root divisions. The seeds should be sown carefully in a flat indoors as they are very fine. Transplant to 6 inches apart when danger of frost has passed. Best in a rich soil in full sun. (An older botanical name for this plant is *Origanum majorana*).

Tarragon (*Artemisia dracunculus*): Perennial to 2 feet, dark green narrow leaves, a loose but erect plant. Tarragon rarely forms seed, therefore is propagated by root divisions or cuttings which should be made in early spring. Plant one foot apart and divide every 3 or 4 years. Grows in ordinary soil but is best in a light soil and full sun. Cut back rather severely and mulch with straw or mound with earth (as is done with roses) for winter protection.

Thyme (*Thymus vulgaris*): A perennial groundcover to 6 inches, it often suffers some die-back in winter but recovers quickly. Grow from seed sown early indoors and plant out 12 to 18 inches apart. Old plants may be layered. Thymes are well adapted to rock garden culture. There are many varieties including caraway-scented thyme (*T. herba-barona*), lemon thyme (*T. serpyllum* var. *vulgaris*) and mother-of-thyme (*T. serpyllum*).

HERBS FOR BLENDED FLAVORS

Chervil (*Anthriscus cerefolium*): Annual to 2 feet. A compact plant, with delicately cut foliage, it is grown from seeds sown in early spring. Thin seedlings to 3 or 4 inches apart. Best in a partially shaded location as the young seedlings are delicate and sometimes fail when exposed to full sun. This plant grows well in a poor soil and often reseeds itself.

Chive (*Allium schoenoprasum*): A well known condiment herb, this perennial grows to 10 inches. Compact grass-like foliage and attractive violet flowers. Propagated by dividing the clumps of bulbs. Plant similar to onion sets; also may be grown from seed. Chives are good as an edging plant and produce showy lavender flowers in July and August. Hardy.

Parsley (*Petroselinum crispum*): A biennial often grown as an annual, parsley is a compact dark-green plant. As the seed is slow to germinate, soak it in lukewarm water for 24 hours before planting. Grows best in a moderately moist soil.

Summer savory (*Satureja hortensis*): Annual, 12 to 15 inches, of loose open habit, dull green leaves. Grows well under a wide range of soil and climatic conditions. Sow seeds where plants are to grow in a sunny situation, and thin to 4 or 6 inches apart.

Herbs to Add Later

Anise (*Pimpinella anisum*): Annual to 2 feet. Delicate in foliage and habit. Grown easily from seed sown in May in a moderately rich, well drained loam and

Roche photo

Well known in Europe, Sweet Cicely (*Myrrhis odorata*) deserves a place in American gardens

a warm sunny exposure. Sow seeds where plants are to grow as they are difficult to transplant.

Caraway (*Carum carvi*): Biennial often treated as an annual, 18 to 24 inches. Of loose open habit with carrot-like leaves, it is grown from seed. Best in a sunny, dry location, growing to 10 inches the first season. Sometimes winter kills, but in some localities it is carried over with the aid of a light mulch.

Coriander (*Coriandrum sativum*): Annual, 12 to 15 inches, of slender habit with delicate feathery leaves. Sow thinly in May where the plants are to grow and thin to 4 or 5 inches apart. Grows quickly and it often self-sows to produce a second crop in early fall. Almost any soil will do, but it is best in a warm, light one.

Costmary (*Chrysanthemum balsamita*): A fragrant perennial herb, to 3 feet or more. Loose and spreading in habit, soft green foliage and small, yellow, button-like flowers. Propagated from seed sown in spring or from root divisions. Best in a dry, sunny location and an average garden soil. Sometimes costmary is weedy-looking, spreading rapidly from side shoots. Requires little care. Hardy.

Bitter fennel (*Foeniculum vulgare*): Perennial from 3 to 5 feet. Loose and erect with finely cut foliage, fennel sometimes flowers the first year. Sow thinly in spring and thin 8 to 12 inches apart in a light, well-drained soil. Do not transplant the seedlings. This plant often withstands dry conditions.

Sweet fennel (*Foeniculum vulgare* var. *dulce*): Annual, 24 to 36 inches. Sow in spring where the plants are to grow and thin to 9 inches in ordinary garden soil. Also called Florence fennel or finocchio.

Lemon balm (*Melissa officinalis*): A fragrant herb, perennial, to 2 feet. Of loose spreading habit and dull green foliage, it sometimes becomes weedy. Flowers white, in late summer. May be grown from seed sown indoors in March or April and transplanted to the garden when 2 or 3 inches in height, 16 to 18 inches apart. Root divisions may be made either in the spring or fall. Grows in almost any soil, in sun or partial shade. Hardy.

Lovage (*Levisticum officinale*): Perennial, 24 to 36 inches. A tall sturdy plant with celery-like leaves, it grows best in a rich, moist soil. Seeds may be sown indoors and transplanted to the garden when 3 to 6 inches tall, 8 to 10 inches apart. Mulch with straw as this plant is apt to winterkill in exposed areas.

Pot marjoram (*Majorana onites*): A low spreading herb with dull green leaves, perennial, growing to 12 inches. Seed may be sown in spring, but is slow in germinating. Cuttings, taken in early summer, provide a better method of propagation. Prefers a warm situation and a dry, light soil. A good ground-cover for the wild garden, or in the rock garden if it can be kept in bounds.

Sweet cicely (*Myrrhis odorata*): A perennial condiment herb growing to 18 inches. Loose but erect in growth habit, it has delicately cut foliage and is easily grown from seed if fresh seed can be obtained. Often it reseeds itself. Usually winterkills in exposed areas.

Though many of the perennial herbs may be grown from seed, it is best for the beginner to buy his first plants from a nurseryman. Herbs are inexpensive, and through root divisions and cuttings the herb gardener may increase his stock of plants.

HERBS IN THE FEAST OF PASSOVER

"And ye shall take a bunch of hyssop . . ."

Helen M. Fox

"—And Moses said unto the people, Remember this day, in which ye came out from Egypt, out of the house of bondage; for by strength of hand the Lord brought you out from this place: there shall no unleavened bread be eaten.

This day came ye out, in the month Abib. (Nissam)

Seven days thou shalt eat unleavened bread, and in the seventh day shall be a feast to the Lord."

Exodus XIII, 3, 4, 6

This feast has been observed down through the centuries, as Moses ordered, wherever Jews practice their religion throughout the world.

Upon return from service at the Synagogue, a dish of symbolic foods is set before the master of the house. These are observed during the eating of a cooked meal of other foods of which one dish is always roast lamb. On the dish of symbolic foods are three wafers of unleavened bread, *matzoth*, generally circular. Over them is a cloth, and on this the following articles are placed in a prescribed order: in the center is the bunch of bitter herbs; at the upper right corner, a shank bone or shoulder of lamb; at the upper left, an egg; in the lower right corner is *charoseth*, a paste of nuts and fruits mixed with wine or vinegar symbolizing the mortar with which the Hebrew slaves made bricks; and at the lower left, *carpas* (today either parsley or celery), and right below the bitter herbs between *charoseth* and *carpas* is horseradish. The horseradish and the bitter herbs symbolize the bitterness of slavery. The egg has been interpreted as symbolizing life resurgent, also the festival sacrifice. The shank bone represents the Paschal helamb, which was sacrificed on the tenth of Nissan, four days before the feast was to take place.

The bread was unleavened because the Children of Israel could not tarry, nor had they prepared themselves any victual in their haste to leave the land of Egypt.

There has been some difficulty in identifying the bitter herbs used, but it is thought by most authorities that they were: two kinds of chicory (*Cichorium intybus* and *C. endivia*), sorrel (*Rumex acetoselloides*), snakeroot (*Eryngium creticum*), pepperwort or chervil (*Lepidium chalepense*), a kind of dandelion (*Picris sprengeriana*) and wild lettuce (*Lactuca scariola*). Today the bitter herbs used in addition to horseradish are parsley, celery and lettuce.

Before the last Plague came, it is recorded in Exodus XII that the Lord said unto Moses—"And ye shall take a bunch of hyssop and dip it in the blood (of the sacrificed lamb) that is in the bason and strike the lintel and the two side posts with the blood that is in the bason;—and none of you shall go out at the door of his house until morning. For the Lord will pass through to smite the Egyptians; and when he seeth the blood upon the lintel, and on the two side posts, the Lord will pass over the door, and will not suffer the destroyer to come in unto your houses to smite you."

The hyssop is not the hyssop we know as *Hyssopus officinalis* but is thought to be a marjoram, *Origanum aegyptiacum,* or possibly caper, *Capparis spinosa,* or even sorghum, *Holcus sorghum.*

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(The Brooklyn Botanic Garden Library has a reference collection of early herbals.)

* John Evelyn's ACETARIA, A DISCOURSE OF SALLETS (1699). One hundred fifty years ago John Evelyn wrote his delightful classic, ACETARIA, on herbs used in the kitchen. This book is at once scholarly and amusing.

The herbs discussed by Evelyn, a contemporary of Samuel Pepys, are the same as those that grow in the amateur herb garden of today. But as his "Discourse" unfolds, they take on a fascination that impels the reader to try immediately a salad or pudding prepared according to Evelyn's instructions.

ACETARIA was made available to the public a few years ago, when a limited edition was printed by the Auxiliary of the Brooklyn Botanic Garden. A few copies are still available at $3.15 (which includes postage and packing). Orders may be addressed to the Brooklyn Botanic Garden, Brooklyn 25, New York.

THE FUTURE OF HERB-GROWING

. . . as a herbalist sees it

Martha Genung Stearns

PERHAPS no subject of such magnitude and such age-old intimacy in every household was ever so completely forgotten in America as herbs have been in the last half-hundred years. Their values and practical applications, even their identities have been forgotten. This whole division of horticulture seemed to vanish from our gardens and thoughts, only lingering as a quaint conceit for the finger-bowl or the linen-drawer. With the advent of proprietary medicines and commercially packaged seasonings, the basic properties of the useful plants went out of mind.

The first World War awakened us to shortages of materials which we had taken for granted; quinine and digitalis, menthol and various essential oils were suddenly lacking and badly needed. The same thing happened on an even larger scale in World War II, when the supply houses for paints, spices, cosmetics, insecticides, oils and drugs ran short. We saw the frantic attempts to find substitutes and to hurry nature in her slow processes by flying seedlings to the tropics for faster growth, and by burning up soil with quick fertilizers.

During the interval between wars, herb growing received a new impetus, and it seemed that the foundation was laid for the new industry. Our dreams of capturing the trade in drugs and condiments did not entirely come true, however. To quote from a writer in "The Herbarist" (No. 6, 1940), "In every war which has affected the commerce between Europe and the western continents, America has been forced to depend largely upon her home-grown crop of condiment and drug herbs. At the close of every war, the grower who has risen to the emergency has been unable to hold his market against revived foreign competition and lowered prices no matter how good his product."

Some of the small growers who have been through the war experience will naturally hesitate to prophesy as to the growing of herbs and useful plants as a paying crop. It seems to me that the answer to this question lies in cottage industry—the production of several varieties of herbs on a small scale by one or two individuals. We, as small scale growers, may not have the space to give to a large crop to be reaped with machinery, but we have our gardens and brains and hands. Old records tell us herbs were a million-dollar crop in New England a hundred years ago, and when better mint-growing soil was found in New York State, a whole community moved there.

We can grow seed of high quality, keeping records of soil, weather, germination, fertilizing, etc. We can grow a clean, well-weeded product, cut it at the best moment, dry it with care and process it by hand. And by storing it carefully until needed we can produce a superlative product. This applies chiefly to the condiment and household herbs; it is probably more practical to leave the drug plants to the big growers and chemists. It is unlikely that we could even keep up with the American demand for chewing gum flavors, which to judge by looking around us, has reached astronomical proportions.

The product could be processed and packaged to make it appealing and salable. The cottage industry almost does away with the middleman. If the purpose is to make money a small, personalized shop can become a delightful place and take on a personality. Herbs fit into homely intimate surroundings like old friends as indeed they are.

Halehaven Peach

McFarland photo

FRUITS FOR THE HOME ORCHARD

. . . how to have them

George L. Slate

A HOME fruit garden that will produce an abundance of fruit throughout the summer and fall with some to store for winter is pleasant to contemplate and plan when the nursery catalogues are coming in. To produce this fruit involves much more than ordering the trees from the nursery and setting them out. Considerable study, patience, expense and hard, as well as messy, work are required to produce any quantity of fruit. Unless one intends to do what is necessary to produce good fruit it will be much cheaper and more satisfactory to purchase it from commercial growers.

Selecting a Site

The prospective home fruit grower should first take stock of his situation and decide whether the site is suitable for fruit. The site alone can determine the success or failure of the project.

Seckel Pear

McFarland photo

The soil must be well-drained, reasonably fertile and well supplied with organic matter. The small gardener must make sure that his plants are set in something better than the subsoil that was dug out of his cellar when the house was built. The shade of large trees and the competition from their roots must also be avoided. Currants and gooseberries will tolerate light shade, but the other fruits must have full sun most of the day if they are to bear well.

Good air circulation is important as it reduces damage from fungus disease and spring frosts when the fruits are in bloom. A slope is much superior to a low spot or frost pocket. It is probably not worthwhile to plant fruits in a frost pocket as too many crops will be lost.

Varieties

The choice of variety has much to do with the success of the planting and one's enjoyment of the crop. With a suitable selection of small fruits and grapes one may have fruit from June until early winter. These may be supplemented by cherries, plums, peaches, pears and apples if one is prepared to spray them. The varieties suggested here are mostly stand-

ard and generally reliable. Many others, probably just as good, are available in nurseries.

Strawberries
Howard (Premier)
Catskill
Fairfax
Temple
Sparkle (best for freezing)

Black raspberries
Bristol
Dundee
Cumberland

Red raspberries
September—bears an autumn crop in addition to summer crop. New.
Newburgh
Latham
Milton

Purple raspberries
Sodus
Marion

Currants
Red Lake

Blueberries
Jersey
Pemberton

Grapes
VanBuren
Fredonia
Seneca
Buffalo
Dunkirk
Delaware
Niagara
Concord
Sheridan
Golden Muscat

Gooseberries
Poorman

Sweet cherries
Seneca
Emperor Francis
Hedelfingen
Windsor

Sour cherry
Montmorency

Plums
Abundance (Japanese)
Burbank (Japanese)
Stanley (European)
Italian Prune (European)
Reine Claude (European)

Peaches
Marigold
Oriole
Redhaven
Raritan Rose
Golden Jubilee
Vedette
Valiant
Halehaven
Veteran
Elberta

Apples
Lodi
Gravenstein
Wealthy
Twenty Ounce
Cox Orange
Jonathan
Rhode Island Greening
Delicious (red sports)
Golden Delicious
Northern Spy

Crabapples
Dolgo
Young America

Pears
Tyson
Clapp's Favorite
Bartlett
Seckel
Sheldon
Bosc

It is necessary to arrange for proper pollination of certain fruits by planting suitable varieties. The small fruits and grapes on this list are all self-fruitful; any one variety will set full crops without cross pollination by another variety. The blueberries will have larger berries if cross pollinated, but good crops will be produced if only one variety is planted. The peaches are also self-fruitful, but the sweet cherries, pears and apples need cross pollination by other varieties. Italian Prune and Stanley plums are self-fruitful, but Abundance and Burbank require cross pollination and each will take care of the other. Montmorency cherry is self-fruitful.

Plants should be purchased from nurseries specializing in fruit plants, rather than from the general nurseryman who carries them only as a sideline. Some firms specialize in strawberries, others in grapes, while others are primarily growers of the tree fruits. The purchaser should select the varieties, not the nurseryman. The order should be placed early while the desired varieties and sizes are in stock.

Culture

Most of the fruits may be set either in late fall or early spring. Late spring planting is often unsatisfactory. Peaches, being less hardy than the other fruits, are safer set in the spring and strawberries are generally set then, although late fall planting is satisfactory.

Soil preparation should be as thorough as for a vegetable garden, especially for the small fruits. Grass sods should be cultivated for a year before planting strawberries to eliminate white grubs, a serious pest.

The small fruits are much superior to the tree fruits for the average home gardener as spraying is often not necessary but if needed it may be done with simple equipment. They fruit early, occupy little space and are very useful in the kitchen as well as for dessert.

Strawberries are first choice in any garden. They are grown in matted rows. The plants are set from 18 inches to 2 feet apart in the row and the runners are spaced about 6 inches apart until the row is filled out to a width of 18 inches, after which the surplus runners are removed to

prevent overcrowding. In late fall after 2 or 3 hard frosts, but before temperatures go lower than 20 degrees above zero, a mulch of straw or marsh hay is applied for winter protection. In the spring, just as growth starts, parts of the mulch is pulled off between the rows where it serves to keep the berries clean and control weeds.

Red raspberries are grown in hedge rows, the plants being set 2 feet apart in the row. The suckers soon produce a hedge which should be kept to a width of not over 1 foot. Surplus suckers are removed as they appear. The black and purple varieties are set 4 feet apart in the row and they do not sucker. The red varieties are pruned by removing the fruiting canes after harvest as they will soon die. The new canes are thinned out the following spring and those that remain to fruit are cut back about one-quarter of their length. The black and purple varieties have their new canes topped when knee-high to make them branch. The following spring the branches are cut back to 8 or 10 inches. The fruiting canes are removed after harvest. Raspberries should not be cultivated after August 1.

Currants and gooseberries are spaced 5 feet apart. Pruning consists of thinning out the canes, leaving about eight equally divided between the one, two and three-year-old canes, all older being removed. For the space they occupy these fruits probably produce as much useful fruit as any plant, and they require little care. They will grow in light shade and may be planted between the tree fruits or grapes.

Blueberries must have a sandy, acid soil with a pH of 5.0 or less. They are long-lived under good conditions and fruit heavily each year. They are spaced 5 feet apart in the row and grow especially well when mulched with sawdust. Sulfate of ammonia is an excellent fertilizer for the plants. It is necessary to cover the plants when the fruit is ripening or the birds will take all of it.

Grapes are spaced 8 feet apart in the row and may be grown on a trellis or arbor. For an arbor, Concord is as good as any of the varieties. Grape training requires more instructions than space permits, but the State agricultural colleges can supply information on this subject.

Peaches, plums and sour cherries are set about 20 feet apart. Weeds are kept down by cultivation or mulching. Pears are cultivated the first 2 or 3 years and then grown in sod, care being taken not to stimulate too vigorous growth which is susceptible to fire blight, a serious disease of pears.

Dwarf apple trees are best for the small grower. The purchaser should specify the Malling IX rootstock and not ask for just dwarf apple trees. They should be set so that point of union of stock and cion is about 4 inches above the ground. This is to prevent cion rooting, which would soon make a full-sized tree out of the dwarf. The shallow, brittle root system necessitates tying the tree to a stout stake which should be set when the tree is planted.

In soils of low or average fertility a nitrogenous fertilizer such as ammonium nitrate, nitrate of soda or sulfate of ammonia is most likely to be profitable. It may be applied in the spring at rates that will provide about 50 pounds of nitrogen per acre. Animal manures are good, but if used in excess may cause late growth and winter killing. Some judgment is necessary in using manures and fertilizers. Too often the uninitiated believe that if a little is good, more is better. Generally speaking if the foliage is dark green and large the plant is probably well supplied with nutrients. A yellowish cast to the foliage may indicate a shortage of nitrogen, although insect or disease injuries may be responsible.

Weed growth must be kept down either by cultivation or mulching. Cultivation should always be as shallow as possible and discontinued about August 1, except with the strawberries, which are kept clean throughout the growing season.

DISEASE AND INSECT PESTS IN THE HOME ORCHARD

How to control them

Lawrence Southwick

OF the many diseases and insects which may attack the home orchard, certain ones should have adequate control measures each season, while others which are encountered only occasionally, may require special attention.

Control measures for the principal pests attacking fruits generally grown in home plantings are suggested here.

Apples

San Jose scale and **rosy aphis.** Both of these insects pass the winter on the trees; they may be best controlled during the dormant period by a spray containing a dinitro product such as DN–289, Elgetol, or Krenite, used at the dosages recommended by the manufacturers, and applied early in the spring before the blossom buds begin to swell.

Plum curculio. This pest feeds on the developing fruit, and deposits eggs in the fruit. It first appears on fruit trees as the petals are falling from the blossoms. Satisfactory control should be obtained by a 10 per cent lead arsenate dust, or a spray containing one-half pound of lead arsenate in 10 gallons of water, applied at least four times at five- to seven-day intervals, beginning as soon as all the petals have fallen.

Codling moth or side worm. This insect often causes serious loss of fruit in home orchards; its immature stage is the common apple "worm." It may be readily controlled by three or four applications of a 5 per cent DDT dust, or four or five applications of a 10 per cent lead arsenate dust, beginning about three weeks after petal fall, and repeated at ten-day intervals. Sprays containing DDT (one-fourth pound 50 per cent wettable per 10 gallons of water) and lead arsenate (one-half pound per 10 gallons) are also effective, used according to the schedule indicated for the dusts.

Apple maggot, or railroad worm, is a very destructive pest in home orchards in the northeastern and north central states. In general, the adult flies appear after mid-June and remain until harvest or near that time. The females deposit their eggs under the skin of the young fruits. The insect must therefore be controlled in the fly stage before the eggs are laid. Treatments effective against the codling moth are suggested for apple maggot, but may need to be continued longer (through July).

Aphids or plant lice are often bothersome, and can be controlled by nicotine in dust or spray (Black Leaf 40), applied in warm or hot weather.

Apple scab is a fungus disease attacking both fruit and foliage. Its development is favored by prolonged rains and humid weather in spring and early summer. Satisfactory control may be secured by applying sulfur dust whenever the fruit or foliage is wet from rain for more than a few hours. Early-season applications are particularly important, and should begin when the buds begin to break. The treatments may be discon-

Author photos

Scars left by the Plum curculio in a mature apple

Punctures made by the Plum curculio in depositing eggs under the skin of the apple

Apples infected with scale which thrives in wet weather

tinued when the apples reach an inch or so in diameter. Sprays containing a pound of wettable sulfur in 10 gallons of water, applied according to the above schedule, may also be used. Application of the dust should be made while the trees are still wet, whereas the spray should be applied as soon as the trees dry. Dusts or sprays containing Ferbam (ferric dimethyldithiocarbamate), used according to the manufacturers' recommendations, are also satisfactory. Ferradow and Fermate are two well-known products.

Pears

Codling moth. This is the principal insect pest of pears in the home orchard, and is controlled in accordance with the directions under apples.

Pear leaf spot and **scab** are fungus diseases, which may be satisfactorily controlled by the treatments recommended for apple scab.

Plums and Prunes

Plum curculio and **apple maggot.** These pests are controlled on plums and prunes in the same manner as outlined for apples, except that here the first treatment for plum curculio should be delayed until the shuck has dropped from the young fruits.

Brown rot is the principal disease, and it attacks both blossoms and fruit. The severity of the disease may be reduced by destroying all fruit on the trees and on the ground under the trees each fall after harvest. Spray and dust treatments should be given, to prevent blossom and fruit infection. The program usually requires three early applications of sulfur spray or dust, the first while the buds are showing pink, the second, just as the blossoms are opening and a third when the blossoms are fully opened. A fourth application may be made by including sulfur in the first treatment for plum curculio. Preharvest treatments of sulfur spray or dust should commence four weeks prior to harvest and should be made weekly. The concentration of wettable sulfur to use in the spray is three-quarters pound in 10 gallons of water.

Black knot. This disease attacks only the woody parts of the plant, such as the twigs and branches. Removal and

Black knot on a plum twig

Peach tree borer attacks at the base of the trunk

destruction of the knots early in the spring is the most effective method of control. Pruning cuts should be made at least a foot in from the knot.

Peaches

Plum curculio. This pest may be controlled on peaches in the same way as on plums and prunes.

Oriental fruit moth. This insect attacks the tips of the growing shoots, and also infests the fruits. Five per cent DDT dust or DDT (spray one-fourth pound 50 per cent wettable per 10 gallons), properly timed, will give much protection against this pest. Three or four treatments should be given: the first when the fruits are about half-grown, and the rest at ten-day intervals.

Peach tree borer. The immature or "worm" stage attacks the trunks of Peach trees at or near the ground. DDT spray or dust should be applied very thoroughly to the lower 12 inches of the tree trunks, especially at the ground level. The treatment should be begun during the last week in July, and repeated at two- to three-week intervals to September 15. If control is not complete with DDT, or if there is established trunk infestation, the borers may be killed by a ring of paradichlorobenzene crystals placed around each tree in the early fall before soil temperatures go below 60° F. The amount of chemical to use (one-half to 1 ounce) varies with the age of the trees, but trees under three years of age should not be treated.

Brown rot and **scab** may be controlled by the schedule outlined for brown rot on plums and prunes.

Quinces

Oriental fruit moth. This is a very destructive pest; and unless control measures are applied, the entire crop is usually destroyed. Control on quince is the same as that outlined for peach.

Leaf blight and **fruit spot** may be controlled the same as apple scab.

Cherries

Aphis. These very familiar insects pass the winter in the egg stage on the trees. They may be controlled the same as the rosy aphis on apples. If this dormant spray is omitted, a 4 per cent nicotine dust or a nicotine spray (5 tablespoons in 10 gallons) applied when the insects are present, will aid in preventing serious injury.

Plum curculio. Control is the same on cherries as on plums.

Cherry fruit fly. The immature or larval stage feeds inside the fruit. Control depends upon killing the flies before eggs are deposited in the young fruits. This may be accomplished by dusting the trees with a 1 per cent rotenone dust. Two or three applications should be made, the first when the fruits are one-third grown, and later ones at seven- to ten-day intervals.

Brown rot may be controlled on cherries the same as on plums.

Leaf spot. This disease may be a serious problem. It attacks the leaves primarily, and under some conditions may defoliate a whole tree. A fungicidal spray or dust containing either copper or ferric dimethyldithiocarbamate (Ferradow or Fermate) will give satisfactory control, if used according to the manufacturer's directions.

Grapes

Berry moth and **leaf hopper.** These are the worst insect enemies of this crop.

Both may be controlled by a 5 per cent DDT dust, or a spray containing one-fourth pound 50 per cent wettable DDT per 10 gallons of water. Treatments should be given first when the fruits are one-third grown, and at two-week intervals thereafter.

Rose chafer and **Japanese beetle.** Both of these pests attack grapes as well as various other plants. DDT dust or spray is effective, used when the pests appear.

Black rot is a disease which attacks foliage, twigs, and fruit. It is best controlled by ferric dimethyldithiocarbamate, used according to the manufacturer's recommendations. Bordeaux mixture gives fair control. Two prebloom sprays or dusts are generally required. The first should be applied when the grape vine shoots are 4 to 5 inches long, and the second just as the blossom buds are opening. Later applications are advisable, and may be made by including the fungicide in the spray or dust applications made for grape berry moth and leaf hopper. In areas where mildew is a problem Bordeaux mixture may be the preferred fungicide.

Bush Fruits and Strawberries

Raspberry fruit worm is readily controlled by a ¾ per cent rotenone dust.

Cherries infected with Brown rot

The first treatment should be given just before the first blossoms open, and a second when most of the petals have fallen. The two-spotted mite can be prevented from causing serious injury by after-harvest applications of ¾ per cent rotenone or a sulfur dust, or by a 1½ per cent summer oil spray.

Currant aphis and **San José scale** are the chief pests of currants. They may be best controlled by a dormant treatment as indicated for apples. Nicotine spray or dust may be used for summer infestations.

Strawberry weevil, strawberry leaf roller, and **spittle bug** may affect strawberry beds. A rotenone-sulfur dust bearing ½ to 1 per cent rotenone is suggested. Treatment should begin as the first blossoms open, and continue at ten-day intervals until three applications have been made.

General Suggestions

1. Dusting is often more convenient than spraying in the home orchard, and is recommended. However, to be as effective as spraying, dusting may have to be done oftener. Dusting should be started as soon as the buds open, and repeated at seven- to ten-day intervals through July. The best time to dust is on quiet mornings or evenings when the foliage is moist with dew or rain. There are all-purpose dusts available, which are both fungicidal and insecticidal. Or, as already suggested, single-material dusts can be used for controlling specific pests.

2. Timely, uniform, and adequate coverage of entire trees is essential.

3. Sprays or dusts containing DDT or lead arsenate should not be applied within four weeks before harvest.

4. In using a commercial product, it is wise to follow the manufacturer's directions.

5. Detailed pest-control programs, applicable to local conditions, are available from county agricultural agents and other agricultural extension workers, or from State agricultural experiment stations.

Author photos

Outside the medieval wall of Visby

GARDENS IN MEDIEVAL VISBY

Roses thrive in the Baltic climate

George S. Avery, Jr.

FOR a thousand years travelers to countries in and about the Baltic Sea have known of the Isle of Gotland. The peak of its culture came in the twelfth and thirteenth centuries. The island has known many masters but for the past 300 years has been under the Swedish crown. Visby, the chief center of commerce, once was the greatest city in the countries of the Baltic—almost as large as the contemporary London, and it long held a high place in what history records as the Hanseatic League.

Trade routes changed, and Visby and Gotland were repeatedly ravished by fire and sword. As a result, the island dropped into almost complete obscurity. All but one of the sixteen churches built in the twelfth and thirteenth centuries still lie in ruins, as they have for centuries, but a number of early buildings remain and are still in use. Nearly two miles of medieval walls are impressive, to say the least.

Within the past fifty years, Visby and Gotland have been rediscovered by travelers who take delight in the charming atmosphere of forgotten centuries.

"City of Roses"

Part of the wealth of the early merchants went into churches and fortifications and probably found its way into gardens, but the intervening centuries of poverty severed the living links that might have told us what these early gardens were like. What we do know is that Visby is now famous as the "City of Roses," and a visitor in the latter half of June or early July will see it at its best. The mild Baltic climate is ideal for gardening.

A walk down one of Visby's narrow and winding streets reveals roses used for almost every effect. If a few inches of space are available between house and cobblestone street, roses are almost sure to ramble up over the facade. Or if the pavement does not permit, roses are certain to be planted at the end of the house and soon find their way to the peak of the roof. Around some of the more recently built homes there is more space, and a rose garden or feature planting of roses is almost invariably included. Ramblers, hybrid teas, floribundas, etc., are all there.

Other than Roses

There are numerous hanging baskets and window boxes, and these frequently feature geraniums, pansies or nasturtiums. An occasional border may include delphiniums, shasta daisies, fuchsias and ageratum. One delightfully situated red cottage, high up on a hillside overlooking the lower town and the Baltic Sea, had a rock garden at the front entrance. It was the only private garden with shrubs in variety that I saw and included two kinds of cotoneasters and one of the small evergreen loniceras. This garden also boasted lemon lilies, foxgloves, blue salvia and torenia.

"Weeds"

In some places it is possible to walk along the top of the wall that surrounds the city. One stretch of hardly more than a hundred feet revealed many different plants, some apparently escaped from one-time cultivation: thyme, two different mustards, sedum (*Sedum album*), a wild rose, scabiosa, yellow bedstraw (*Galium verum*), medicago (*M. falcata*) and bugloss (*Anchusa officinalis*).

Grass is the most common wall vegetation; clumps of it grow between the stones or along the top of the wall where decaying limestone provides a meagre soil.

Botanic Garden

The two or three acre botanic garden is quite delightful in its layout, though in no sense is it old. The garden must have been established when the Visby ruins began to attract visitors in considerable numbers. Most of the plants are labelled, and casual conversation with more than one Visby citizen—within the limits of language—revealed that the labels are not lightly taken. Even the Latin names were handled with ease.

Visby's charm lies chiefly in its antiquity, in the atmosphere created by the centuries-old wall, ruins of churches and early buildings which are still standing. But without its gardens, roses in particular, Visby would lack the touch of color that gives it warmth. The familiar flowers every gardener knows help make Visby a place one wants to visit again.

A portion of the old wall where weeds appear to thrive on decaying limestone

Louis Buhle photo

WITHIN THE BROOKLYN BOTANIC GARDEN

Tropical Waterlilies

September arrived to find the tropical waterlilies bright and lovely, reflecting the waxy perfection of their flowers in the water of the large pool west of the greenhouses. The pure white flowers of the variety Missouri are 10 or 12 inches in diameter. The soft petals move constantly when a slight breeze crosses the pool. Bob Tricker is a clear sky-blue which seems to be illuminated from within. The flowers are about 8 inches across. The bronze-red leaved Pride of California has heavy flowers of deep magenta-red. St. Louis is a large pale greenish-yellow variety with deep golden-yellow stamens; it could easily be a favorite.

Close by the pool are two old trees of *Magnolia soulangeana* var. *lennei* which have had a few blooms on them throughout the summer. The deep rosy-purple of the petals seems to reflect the color of many of the waterlilies.

The New Iris Garden

The new iris garden has been planted and promises to be beautiful next May. Arranged according to the classification of the American Iris Society, the colors will blend into each other from white through cream, pale yellow to golden yellow, the pale blues into dark blue and through purple to red. It will be easy for the viewer to compare the varieties of one color, but to pick his favorite blue or purple or yellow iris may be difficult.

One bed is to be planted with the varieties which have won the Dykes Medal, the highest award of iris. Three awards are given each year for the best iris in England, France and the United States, so a collection of these varieties constitutes a stunning display of iris royalty.

FAMILIES OF HERBS

How to know them

The great majority of herbs commonly grown belong to five large families:

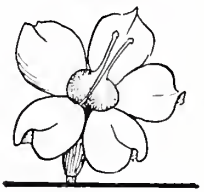
1 **The Mint Family** (*Labiatae*) with square stems and mostly irregular, 2-lipped flowers, 4 stamens, and fruit with 4 nutlets ('seeds'). Here we find: mint, basil, sage, ajuga, teucrium, rosemary, lavender, horehound, nepeta, agastache, lamium and thyme.

Monarda

2 **The Composite Family** (*Compositae*), sunlovers with 2 kinds of flowers, ray and disk combined into heads, fruit and achene. Here are elecampane, chicory, tussilago, chrysanthemum, tansy, artemisia, santolina, rudbeckia, calendula and eupatorium.

Calendula

3 **The Parsley Family** (*Umbelliferae*), often with hollow stems, flowers in flat-topped umbels. In this group fall: caraway, chervil, coriander, dill, fennel, cumin, lovage, pimpernel, myrrh, wild carrot, parsley, angelica, goutweed and skirret.



Dill

4 **The Borage Family** (*Boraginaceae*), with tubular flowers mostly in curved racemes, 5 stamens on the tube. The ovary is superior, usually forming fruit of 4 nutlets. All related under this grouping are: borage, cynoglossum, forget-me-not, mertensia, pulmonaria, symphytum, anchusa, brunnera, echium and heliotrope.

Comfrey

5 **The Mustard Family** (*Cruciferae*), with 4 petals opposite each other, forming a square cross, 6 stamens (4 of which are long, 2 short), and superior ovary. In this family are: woad, mustard, peppergrass, honesty, upland cress, dentaria, stock and watercress.

Mustard

This very general presentation of herb families is based upon the classification of Dorcas Brigham whose article appears upon pages 132–134 of this issue.

BROOKLYN BOTANIC GARDEN

OF

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BROOKLYN BOTANIC GARDEN RECORD

PLANTS & GARDENS

WINTER
1950

The
Year's Highlights
in
Gardening
and
Horticulture

Guide to
Recent Nontechnical
Books and Articles
about Plants

NEW SERIES
VOL. 6 NO. 4

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PLANTS & GARDENS

Styrax japonica

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Except where otherwise credited, drawings by Michalena L. Carroll

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Winter 1950

ABOUT THIS ISSUE —

We present with pleasure our Editorial Committee's sixth annual selection of articles of significant interest, condensed from nontechnical gardening and horticultural magazines of the year. It is with considerable satisfaction that we so honor the authors and the journals in which the articles were originally published.

OVER THE LONGER TERM —

Thanks in large measure to the Garden Clubs, probably more people are growing more kinds of ornamental plants in America in 1950 than ever before. Our forebears all gardened, but they were busy raising food. Now most of us buy mass-produced food, and garden for the love of it, with emphasis on things of beauty, things that give us a spiritual uplift. Few of us are gifted in the use of brush, pigments and canvas, but every gardener can paint a picture with flowering plants. The urge to be creative finds a ready outlet in gardening and horticulture.

The demand for plants is something the nurseryman can supply, and so it is that the nursery business is bigger than ever in history. Nurserymen have produced new varieties by the thousands in certain plant groups that have a ready market -- roses, chrysanthemums, tulips. But other worthy groups of plants are awaiting discovery, development or wider appreciation. This is where botanic gardens can perform a real service -- if they have a chance, or rather, if they have the funds.

In the past three months I have seen two newspaper accounts that reported gifts and bequests running into tens of millions. One was a huge trust, chiefly for the relief and care of the aged and the construction and maintenance of hospitals. This is good, and necessary, but why stop at trying to patch up broken health and human heartaches? Gifts and bequests might also go to work for beauty and inspiration — these are preventives, and there is more than a little truth in the old adage, "an ounce of prevention ....."

Gardening and horticulture should be high up on the docket of human welfare needs, and deserve fully as much support as the patching-up services.

George D. Avery, Jr.
Director

Errors known to occur in this volume are corrected at the end of the index.

← A winter view in the Brooklyn Botanic Garden

Except where otherwise credited, photographs by Louis Buhle

MULCHES

What the gardener should know about them

A. E. Hutchins

Condensed from *Minnesota Horticulturist,* June and Aug., 1950

MULCHES of one kind or another have been used since time immemorial.

What is a Mulch?

A mulch may be defined as any protective covering of the soil. This could be a covering laid down by nature, such as forest litter, the dead grass of the wild prairie or the decaying deposits of marshy lands. However, we can limit the definition to those soil covers provided by the gardener.

Mulch may be merely a layer of dry soil; or it may be composed of straw, well rotted manure, sawdust, pulverized peat, other organic materials, paper, and sometimes even gravel, boards, or minerals such as glass wool. Leaves, lawn clippings, and vegetable tops can be used.

What Does it Do?

A mulch serves as a protective covering. Probably its chief function is to keep the soil surface from direct contact with the wind, warm dry air, and the direct rays of the sun. Incidental to this, many effects are produced which are often beneficial to the growth of the plant.

Organic Mulches

The term *organic* can have a great many meanings, but for our purpose we can define it as plant remains.

Many Benefits. In many cases, the greatest benefit of an organic mulch lies in its effect on soil moisture. By keeping the soil loose and porous, the mulch often increases the ability of the soil to absorb moisture. By providing a protective covering, it reduces moisture loss from the soil surface. It also may reduce the water runoff from the soil surface, thus conserving moisture and aiding in the prevention of erosion by water and wind.

The soil under the mulch often is better aerated and serves as a better medium for the growth of plants and beneficial soil bacteria. As a result of this, decomposition of organic material in the soil takes place more rapidly with a consequent release to garden plants of the fertility elements bound up in the organic matter. The mulch prevents baking of the soil surface and usually aids in weed control.

Under the mulch, the soil temperature tends to fluctuate less. Thus the soil is cooler in summer and warmer in winter. Organic mulches also serve to keep such garden products as strawberries, tomatoes, and melons clean by preventing splashing of dirty water when it rains.

Aside from the value of organic matter as a mulch, it may have other benefits if it is worked into the soil as it decomposes. The physical condition of the soil is improved. Drainage and aeration become better on heavy soils. The water holding capacity of light soils is increased. As it decomposes, it adds fertility to the soil.

Some Disadvantages. Care should be taken to see that the mulch is free of mature weeds, since an unclean mulch may add weed seed to the soil.

The organic mulch may sometimes reduce the soil intake of water by absorbing most of the rainfall and releasing the moisture into the air again by evaporation with very little of it reaching the soil (a dry peat mulch for example).

Where the organic mulch is used on such plants as trees, shrubs, and perennials, it must be maintained. It tends to cause the plant to produce many roots close to the soil surface. If the mulch is removed, these roots may dry as the soil surface dries.

Published by the Minnesota State Horticultural Society, University Farm, St. Paul 1, Minn.

There is some danger that the mulch may be a fire hazard if it becomes dry. It also may provide a haven for rodents.

If the mulch is worked into the soil, care should be taken not to work in too much at one time. The bacteria that decompose the organic matter in the soil use soil nitrates in doing their job. This results temporarily in a shortage of available nitrogen for the plants.

In general, it would seem that the advantages of the organic mulch in home gardening outweigh the disadvantages.

Dust Mulch

Weeds are capable of removing large quantities of water and fertility from the soil and thus become strong competitors of our garden plants. In some cases they may compete for light also. The killing of weeds, therefore, is the main purpose of cultivation. However, another function is to maintain a soil mulch.

The stirring of a moist soil surface by cultivation results in the formation of a dry, loose layer which serves as a mulch over the moist soil beneath. Water moves upward in the soil through capillary action. Much moisture may be lost by surface evaporation. A dry soil mulch decreases or stops this capillary flow and thus may stop or cut down the loss of moisture from the surface. However, if the soil surface is dry before cultivation, there is little or no benefit derived from the soil mulch in this respect, since a dry surface breaks the capillary action whether the surface is loose or compact.

The dust mulch may be of benefit in preventing runoff of moisture on heavy soils, in decreasing and remedying baking and cracking of certain soils, and improving aeration of heavy soils. On the other hand, a dust mulch is of little benefit in the aeration of light soils, and has little if any effect on moisture conservation in semiarid regions or on light soils, except insofar as it controls weeds. It may increase the loss of soil through wind and water erosion on any soil.

MATERIALS FOR MULCHING

Some of these may be available in your area.

SAWDUST

SPENT HOPS

WOOD SHAVINGS

SHREDDED BARK

BUCKWHEAT HULLS

GROUND CORNCOBS

SHREDDED SUGAR CANE

STRAW

SEAWEED

SPANISH MOSS

PEANUT SHELLS

COCONUT FIBRE

CRANBERRY TOPS

COTTONSEED HULLS

OAK LEAVES

PINE NEEDLES

Virginia Truck Experiment Station photos

Aluminum foil mulching of lettuce, celery, and snapbeans

ALUMINUM FOIL MULCH

A boon to garden crops

V. A. Tiedjens

Condensed from *Flower Grower*, July, 1950

ALUMINUM foil has many advantages, although its cost now limits it to crops of high value per acre or to the garden where costs are less important than the job of weeding.

Weeds and Temperature

Aluminum foil, like other mulching materials, controls the growth of weeds but does a better job because it is not porous.

This foil is an ideal insulating material. Because it reflects the sunlight, it has a cooling effect on the soil. On bright, sunny days the covered soil may be as much as 20 degrees cooler than soil exposed to the sun's rays. This is good for potatoes and root crops.

On cold nights, when temperatures approach freezing, the soil under the foil will remain as much as 8 degrees warmer than the exposed soil. Evenness of soil temperature tends to promote more uniform growth, which is reflected not only in higher yields but in much improved quality.

Moisture

The moisture content in soil under aluminum foil is always at least 8 per cent higher than in exposed soil. This is because the aluminum foil is usually cool. Water vapor coming to the surface of the soil is condensed on the foil and drips

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Unmulched endive at the Virginia Truck Experiment Station. Compare with photo below

Mulched with aluminum foil, endive and lettuce gave an enormous increase in yield. No weeding was necessary

back into the soil. Thus the surface feeding roots benefit.

The soil is completely covered with the foil except where the plants come through, a 2-inch open strip along each row. Any rain water that hits the aluminum must run down this small crack or run off. Because the foil protects the soil from beating rain, the surface never bakes under the foil. After two years the soil under the aluminum foil tested at the Virginia Truck Experiment Station was as mellow as when the foil was put down.

Diseases and Insects

Plants mulched with aluminum foil do not show mildew so readily. This may be because moisture from the soil does not come in contact with the foliage. The foil acts as a perfect seal, preventing the water vapor from moistening the air around the foliage.

The use of aluminum foil prevented damage to beans from Mexican bean beetles and damage to cantaloupes and cucumbers from pickle worms. This may be due, at least in part, to the glare from the shiny aluminum foil, which might discourage adult insects from alighting on the leaves.

Uses and Methods

Experiments using aluminum foil as a mulch for garden plants were made in coastal Virginia, where maximum summer temperatures do not exceed 94° and where green crops may be grown most of the time during the winter months. Garden plants tested, all of which showed

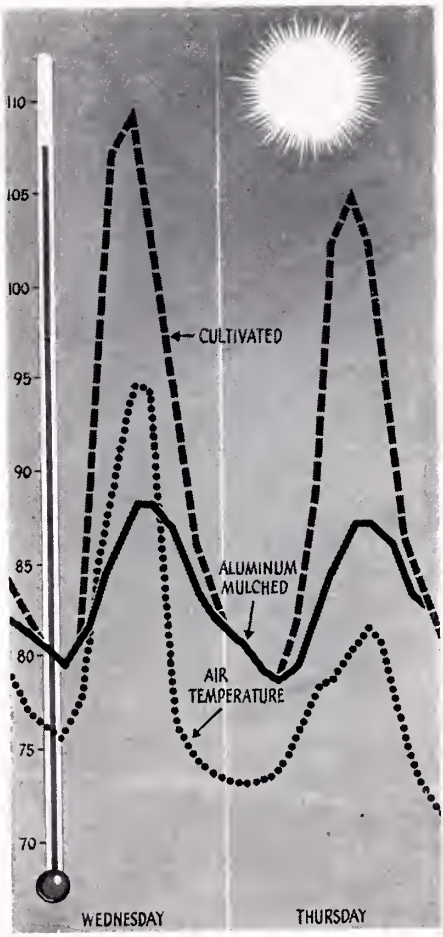
phenomenal increase in yield included: beets, broccoli, cantaloupe, carrots, celery, chicory, cucumbers, endive, head lettuce, leaf lettuce, parsley, snap beans, sweet corn, sweet peppers, sweet potatoes, and tomatoes.

Before the crop is planted fertilizer should be broadcast. Later, if necessary, the plants can be fed by pouring a fertilizer solution along the row between the edges of the foil or in the openings around the plants.

The foil is laid down in strips, with a row of seed or young plants along one edge. Then another strip is laid, with the edges pressed in and covered with soil. The use of aluminum foil makes it possible to grow plants closer together.

The entire bed may be covered with foil and plants set through holes punched in the foil. This works very well for propagating azaleas. Gladiolus cormels planted under foil (in rows 4 feet apart) show emerging shoots one to two weeks earlier than unmulched cormels.

Aluminum foil does everything for the gardener except plant the seed and harvest the crop.



↑ Aluminum-foil-mulched celery in Arizona

← This chart contrasts the soil temperatures: ordinary soil heats under a June sun; foil-mulched soil remains much cooler

↓ Foil-mulched strawberries produce a heavy crop

Seabrook Farms photos by Taubert

Young azalea plants produce heavy root systems when mulched with sawdust

SAWDUST MULCH

Its value on rhododendrons and azaleas

James S. Wells

Condensed from *American Nurseryman*, Oct. 15, 1950

SAWDUST should be considered as an inexpensive and readily available soil conditioner, particularly for ericaceous plant material, and as a first-class mulch for almost any kind of plant. The sawdust serves as a means of blotting out weeds, and it controls evaporation of water from the surface of the soil, providing moist conditions for the fine hair-like roots which are typical of most ericaceous plants.

As an example, some young azalea plants which had to be moved in June were planted in soil which had been infested with weeds before being plowed. Weed seeds were abundant in the soil; if normal methods of weed control such as hoeing and hand-weeding were relied upon, the young plants soon would have been submerged. As soon as planted, the azaleas were mulched with raw sawdust

Published by American Nurseryman Publishing Co., 343 South Dearborn St., Chicago 4, Ill.

One-year-old azaleas, showing depth of sawdust mulch applied immediately after planting

to a depth of 2 inches or more. The sawdust completely controlled the weeds. Two light dressings of tankage (7 per cent nitrogen) to the azaleas aided in producing healthy growth and kept the plants free of signs of nitrogen deficiency. A few rhododendrons, planted in the same plot and too small to be mulched, were completely engulfed by weeds and had to be transplanted at the end of two months.

Another block of rhododendrons was heavily mulched with sawdust after being planted in normal soil to which had been added a fair amount of peat. Early in the spring the whole block showed signs of nitrogen starvation; the leaves on almost all the plants were yellow. The intensity varied from a pale green to a bright chrome-yellow. As soon as possible in the spring, one light dressing of sulphate of ammonia was applied, about 350 pounds to the acre.[1] Within two weeks the plants had begun to change color. Within three weeks, the leaves were a healthy green; and since that time the plants have made two sets of clean, vigorous growth which showed no signs of nitrogen deficiency or chlorosis.

Sawdust can be used successfully by almost any grower. A nitrogen deficiency will almost certainly appear; and so the grower must be ready to supply the necessary nitrogen, not only to feed his plants, but also to feed the bacteria which are breaking down the sawdust.

[1] Or about a pound to 125 sq. feet.—Ed.

SAWDUST MULCH IN ARBORETUM

Sawdust has been used as a mulch on nearly all of the woody plants, including the hardwoods, conifers, yews, and rhododendrons, in the Arboretum of the Missouri Botanical Garden. A half-inch mulch of sawdust also has been applied to nursery beds after seed has been sown.

The only danger appears to be a possibility of creating a nitrogen deficiency when decomposition of the sawdust takes place; but the condition is temporary and can be corrected easily by supplying additional nitrogen. Rhododendrons, which usually respond favorably to sawdust mulch, may need annual applications of nitrogen. A careful check of the soil acidity must be kept to warn of any changes which might be detrimental to the plants.

In the Middle West sawdust is available in several forms, which differ in their value as mulching materials. The sawdust from a high-speed circular saw is rather fine and tends to pack down and form a water-tight crust if left undisturbed. Mills making barrel staves produce a very coarse sawdust. This material is stringy, somewhat like excelsior, and is called "stave tow." The stave tow is not easily invaded by fungi, does not break down rapidly, and retains the characteristics of a desirable mulch for a longer period. Both types, the stave tow and the fine sawdust, have been used at the Arboretum with excellent results. We use it either in the fresh state or aged, according to whether demand or supply is greater.

The need for mulching is so great in the Middle West that we have no hesitancy in using sawdust whenever possible. The only limitation is purely economic; we shall continue to use as much sawdust as possible so long as the cost does not exceed that of other materials.

August P. Beilmann

SAWDUST MULCH FOR MANY KINDS OF PLANTS

Sawdust has proved to be a satisfactory summer mulch for lilies and other bulbs. It is inexpensive and durable; it conserves moisture, greatly reduces weed growth, eliminates root injury from cultivation, and gradually adds organic matter to the soil as it decays. The principal disadvantage is a tendency to rob the soil of nitrogen as it breaks down. This is easily overcome by using about twice as much quickly available nitrogenous fertilizer as is customarily used on the same soil type to produce satisfactory plant growth.

The mulch may be applied at any convenient time when the plants are dormant, but late fall when other garden work is finished is the best time. A depth of an inch is sufficient for moisture conservation, but a depth of 2 or 3 inches is more effective in preventing weed growth.

Many other plants respond well to mulching with sawdust. Those I have successfully handled in this way include crocus, *Colchicum*, peonies, *Lycoris*, strawberry, blueberry, and columbines; the last two have performed exceptionally well.

The use of a sawdust mulch has made it possible for me to maintain far more plants than I could possibly handle with a hoe.

George L. Slate

MULCHING SEEDBEDS WITH CELLOPHANE

For quicker and more uniform germination of tree seeds [1]

Albert Engstrom

Condensed from *Journal of Forestry*, April, 1950

NURSERY practice generally demands that seedbeds be covered with a mulch in order to hold moisture in the germinating medium. Burlap, pine straw, and prairie hay are some materials commonly used for mulching.

In 1949 and 1950 in the Oklahoma State Nursery we used a heavy grade, moisture-proof cellophane. We tried four methods of application: (1) cellophane above burlap; (2) cellophane under burlap; (3) cellophane alone; (4) cellophane under 1-inch mesh poultry wire. We quickly learned that cellophane was not durable enough to mulch a seedbed without supplemental covering material to hold it in place; the exposed cellophane shrank and tore within a week's time.

The action of cellophane and a large pane of glass are very similar. Within a short time after the cellophane was laid on the ground, moisture collected under it, forming droplets of water. Consequently, the seed and the germinating medium were kept uniformly moist. Watering was not necessary.

The seed remained undisturbed from the time it was sown until the bed covering was removed. The cellophane was removed when germination had progressed to a stage comparable to that allowed under burlap cover.

Fall-sown cedar beds covered with cellophane germinated as much as three weeks earlier than beds covered with burlap only. Germination was more uniform and complete. Initial growth was more vigorous, and this early advantage persisted throughout the growing season.

At digging time there were more seedlings in the cellophane-mulched beds and they were 1 to 2 inches taller than those in beds mulched with burlap only.

The use of materials more economical than burlap is entirely feasible. Since the purpose of this covering is merely to hold the cellophane in place, it is likely that lighter materials, similar to that used in grocery stores for onion sacks and grapefruit bags, may be satisfactory.

This year (1950) we used a 3-inch layer of cotton burs from a nearby gin to hold the cellophane in place. This material happened to be readily available and so far has served its purpose very well. When the beds are uncovered we propose to leave these burs in the aisles between the beds, gradually working them into the soil as an organic supplement.

[1] Might also be tried by the home gardener.—Ed.

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CORNCOB MULCH

Ground cobs in garden and greenhouse

I. A. Fight

Condensed from *Horticulture*, Nov., 1949

CORNCOBS are useful in several ways. They change the structure of the soil, making it more porous, which means more air for the roots, and thus greater root development and larger tops and better production. The sugar in the ground cobs is leached into the soil and is used by bacteria which in turn have their effect on soil structure. By virtue of this structure, more water can be applied to the soil more safely.

However, as the ground cobs decompose, the nitrogen in the soil is used in the process by various organisms. Additional nitrogen must be supplied at the time of corncob application and regularly thereafter until complete decomposition has taken place. Since such organic fertilizers as blood, tankage, cottonseed meal, and soybean meal decompose slowly, they are suggested in combination with cobs. However, since the first reaction is quick, it is best to use such inorganics as ammonium sulphate or ammonium nitrate at the start. Later the organic materials may be substituted. If these do not contain phosphorus and potash, such materials should be added. This applies in particular to blood. Tankage contains some phosphorus, while soybean meal and cottonseed meal have both phosphorus and potassium.

Corncobs retain a good deal of moisture so that the depth of the application about the stems of plants depends on the kind of plant.

Finely ground corncobs may be used successfully as light mulches in flats and benches where seedlings are pricked off to make sure that high nitrates do not prevail during the initial starting period.

Published by the Massachusetts Horticultural Society at Horticultural Hall, Boston 15, Mass.

GROUND CORNCOBS AS A MULCH FOR ROSES

A satisfactory mulch is one that: (1) is easy to obtain, (2) is reasonably priced, (3) is not unsightly, (4) will not be blown away, (5) will allow penetration of moisture and still prevent excessive evaporation of moisture from the soil, (6) has some insulation value, and (7) contains substances that tend to improve soil aggregation and aeration.

Many of the common mulches have most of these prerequisites, but few possess them all. During the past eight years the Department of Horticulture at Ohio State University has been conducting experiments on the value of certain mulches on the bloom production of outdoor roses. As a result of these experiments, ground corncobs were found to have all the prerequisites stated above, except possibly the first. Corncobs are now a surplus product, and most grain mills will not grind them except as they have spare time. Ground corncobs are inexpensive and not unsightly; they don't blow; and they are of such a nature that rain readily penetrates through them into the soil, yet they retard soil moisture evaporation. Tests have shown that the temperature of the soil beneath a corncob mulch is more uniform than where clean cultivation is practiced.

During the past few years we have been particularly cognizant of the importance of good soil aeration. Soil aeration is usually satisfactory when the soil is well aggregated. Experiments have shown that ground corncobs contain some water-soluble material that aids soil aggregation. New cobs contain this material in greater amounts than old cobs.

The new cobs should be coarsely ground, in pieces ½ inch or slightly larger in size. The mulch should be 1½ to 2½ inches in depth. It is advisable to stir the mulch two or three times during the summer. Little watering will be required unless excessive dry periods occur. Results have indicated that a ground corncob mulch will aid in the prevention of black spot. Fertilization should be somewhat heavier where any organic mulch is used since nitrogen is used in its decomposition.

L. C. CHADWICK

PAPER MULCH

Condensed from *Minnesota Horticulturist*, Aug., 1950 (see page 196 of this issue)

The use of paper seems to be most beneficial with warm-season crops, and under unfavorable conditions, such as poor soil, deficient precipitation, and low temperature. The effect of the paper varies not only with local climatic conditions but also with each crop grown. An impervious black asphalt base paper laid between the plant rows gives the best results.

Weeds are eliminated to a large extent in the area covered. As with organic mulches, the paper conserves moisture, keeps the fruits of low-growing crops clean, and keeps the soil in a loose, friable condition. However, in contrast to organic mulches, it tends to increase the soil temperature.

Slight increases in earliness and quality, and reduction of the amount of labor necessary for cultivation, often appeal to the home gardener; and the paper will retard the weeds for a few days or weeks when he may be on vacation or busy with other work.

A. E. HUTCHINS

Spent hops used as a mulch on a recently transplanted weeping hemlock at the Brooklyn Botanic Garden

SPENT HOPS AS A MULCH

Spent hops have been used in the Arnold Arboretum as a mulch for woody plants for many years—with excellent success. For the owner of the small garden, however, they may have their disadvantages because of the very strong odor. If the material has been freshly applied about the foundation planting of a home, I can imagine that the odor might drive people out of the house, especially on warm sunny days.

Used in larger areas, where the odor is not seriously objectionable (it disappears after a few weeks), spent hops prove a very effective mulch. In the Arboretum we use it on practically all our woody plants. Like other mulches, it conserves the soil moisture, raises the soil temperature in the late fall and early spring, and aids bacteria in their work in the soil. Spent hops, direct from the brewery, are very wet and have a pH of about 4.5. One 6-inch application about a plant will last at least three years and sometimes longer. Stirring the material once or twice during the growing season aids in keeping down any of the weeds that may have grown up through it.

In the Arnold Arboretum two of the most important characteristics of this material are that when it is dry it does not blow away and does not burn if a lighted match or cigarette butt is thrown into it. Many other mulch materials burn easily.

Because of the tremendous amount of water in them, fresh spent hops heat very readily when freshly applied in the summer months. Keeping them at least 6 inches away from any young stems is all that is necessary to overcome this difficulty.

As an effective mulch spent hops are excellent; but remember that the odor stays with them for several weeks.

Donald Wyman

Author photo

With a mulch of buckwheat hulls—

ROSES ARE NO TROUBLE

Helen S. Hull

Condensed from *Popular Gardening*,
May–June, 1950

IT would be over-optimistic to claim that mulching is a panacea for the problems of rose culture. Mulching is only one factor of many which contribute to good growth. It keeps the weeds down, obviates the need to disturb the soil, prevents evaporation from the surface, and assures the plants a steady supply of moisture. Moisture makes plant nutrients available in solution, a necessity for growth. Mulching keeps all these dependent factors fairly constant.

People say to me, "Your roses never seem to stop blooming"; this is true because even in hot weather the roots are cool and moist under the mulch. Water is available for the plant to lose through its leaves on hot days without drawing moisture from its own tissues (wilting).

It is important to have a mulch which will not soak up water. Peat moss has this defect of soaking up and holding moisture like a sponge.

Ideal Mulch

Buckwheat hulls have been found to answer all the requirements of a mulch, with several additional advantages. They are neat in the bed, a pleasing dark brown color, and light to handle. In spite of their lightness, they do not blow in the wind nor do they disintegrate rapidly. We remove them in the fall, store them in

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sacks, and use them again the following spring.

Spring Care

In late March, the roses are uncovered from their winter mulch (soil heaped up 10 inches around the bushes, and strawy manure between them). We allow the ground to warm up and dry out sufficiently to permit a light cultivation. A light application of 5–10–5 is added and a 2-inch mulch of buckwheat hulls. This is usually in May, although I would wait longer if the spring is wet.

Watering

From then on, if needed, we let the water run until the area is soaked. Buckwheat hulls are so light and nonabsorbent that they lift up and let the water go beneath them. This has two advantages: buckwheat hulls do not take any of the water and they aid in spreading it evenly over the bed. When the hose is shut off, the hulls settle back into place with the top layer not even wet. Thus there is always a dry, insulating layer between the sun and the ground.

How often watering is necessary depends, of course, upon the weather. All that is needed to determine this is to push the mulch away and feel the ground. All during the drought of the past summer and the excessive heat in New Jersey, the rose beds were watered only once in two weeks.

It is a belief of mine also, that this dry layer of buckwheat hulls in the beds is a deterrent to the spread of black spot. My bushes have leaves all the way down the canes at the very end of a season which was hot and humid, a condition especially favorable to the spread of this disease (see photograph).

WINTER MULCHING

Winter mulching is an important but often misunderstood part of gardening. A winter mulch is beneficial especially for perennials and oftentimes necessary for their survival.

A winter mulch is often wrongly thought of as a blanket for keeping plants warm. This mistaken idea leads to the heavy covering of plants before the soil freezes and their subsequent rotting during the winter. A mulch is provided to prevent the alternate freezing and thawing of the soil around the crown of the plant; thus it prevents the heaving and tearing of the roots caused by the expansion and contraction of the soil. Late winter is the time of danger; temperatures fluctuate from warm and spring-like to many degrees below freezing from day to day, or even in a few hours. A winter mulch is helpful in keeping the soil temperature more nearly constant. If plants are mulched after the soil has frozen and are uncovered in the spring when the soil may thaw without danger of becoming frozen again, they are able to withstand more severe conditions than if left unmulched.

The ideal winter mulch is snow; it is light and insulating. Soil temperature under a covering of snow is little affected by the rapid changes in air temperature. The next best thing is a covering which simulates the conditions created by a snow mulch. Glass wool probably comes nearest to establishing snow-mulch conditions, but it is expensive. Evergreen boughs (those cut from left-over Christmas trees are excellent), oak leaves, salt hay, and peat moss shade the plants from the winter sun and do not mat down on their crowns. These materials aid in preventing the damaging alternation of freezing and thawing.

Carlton B. Lees

McFarland photos

Japanese primrose (*Primula japonica*) grows vigorously at the water's edge as well as in woodland gardens

PRIMROSES FOR EVERYONE

Attractive and easy to grow

Nola E. Wibel

Condensed from *Flower Grower*, May, 1950

WE are just beginning to appreciate the value of primroses for our rock gardens and those problem shady spots. Primroses like cool, shady places; some prefer the moist soil of swamps and streams; but a few of the more vigorous varieties will tolerate sun-baked situations.

These harbingers of spring begin to bloom almost before the snow is gone, and continue into July. A few of them may bloom again in the fall if there is a long growing season. They're outstanding for hardiness.

Perhaps the most familiar primrose is the polyanthus, one of the easiest to grow. Put it anywhere but in desert-dry soil, and it will thrive with no more care than that given to any other perennial, although it makes the best display when provided with afternoon shade. The plants grow about a foot high, with clusters of blossoms of almost every color. In the East, the polyanthus begins to bloom the first of May, continuing into June.

Asiatics

The lovely Asiatics demand some additional attention. Of these, *Primula ja-*

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ponica is easiest to grow. The flower clusters, in shades of red, pink, and white, are arranged in whorls around the stems. These flowers are classed as candelabras. The 2-foot flowering stems stand straight above the rosette of leaves.

Another of the candelabras is *Primula burmanica,* a violet beauty from Burma. From China comes *P. aurantiaca,* with bright whorls of orange flowers. *P. Bulleyana* is similar, with lavender, apricot, and buff-orange flowers towering above the leaves.

A popular Asiatic is *Primula Sieboldii,* which blooms in late spring. It has soft, crinkly leaves with scalloped edges, and exquisite flowers varying from white to deep pink. It is dormant for a while in the summer. My own favorite is *Primula rosea grandiflora,* with its bright pink clustered blossoms. The flowers bloom on 8-inch stalks almost before the leaves appear in early spring. This primrose needs an abundance of water.

A lovely dwarf among the Asiatics is reddish-violet-flowered *Primula Veitchii.* It forms wide mats, which are covered with bloom during late April and early May. It will tolerate more sun and less water than any of the others and lends itself to rock gardens and carpeting for woodlands.

The Tibetan cowslip, *Primula Florindae,* likes a swampy habitat. The sulphur-colored bells grow on plants 3 to 5 feet tall. One of the late-blooming (July) varieties, it likes its feet in water but must have good drainage around the crown. This giant is one of the easiest to grow. *P. denticulata* [and its varieties] grow under the same conditions as polyanthus.

Europeans

Primula Juliae [and its varieties] from Europe are creepers, some forming dense rosettes, others spreading into large mats. Their single blossoms cover the plants from early spring into summer, in almost any color. An unusual one is the hose-in-hose—one blossom grows out of another. This group likes a rather heavy soil, with water when needed, and is at home in rock gardens.

Primula vulgaris is a true dwarf, with gay blossoms all over the clumps in early spring and again in the fall. These look best grown in mixed colors.

Primula Auricula has been perhaps the most widely cultivated primrose through the centuries. The tubular centers of frosty yellow and white are surrounded with a scalloped edging, in colors ranging from brilliant velvety purples, pinks, and reds to yellow, gray, brown, and henna shades. These trusses are held on stiff stems above the light, shiny green rosette of thick leaves. Blooming somewhat later than polyanthus, they provide bloom into late spring and off and on during the summer and fall. They are a natural for rock gardens, as they must have perfect drainage. Give them a soil into which has been worked coarse gravel or rock chips around the crowns. They will tolerate a good deal of sun, if sufficient moisture is given.

Among the auriculas are a class of true alpines, tiny dwarfs which are happiest tucked into the crevices of rocks in a soil somewhat leaner than the garden auricula requires. Where summers are not too hot, this group will stand almost full sun.

The gem of this group is *Primula marginata,* a lavender beauty which grows well in the cool crevices of rock walls. The saw-toothed leaves are beautiful in themselves. This variety can also be grown in a rock garden or in a raised bed with a surface of rock chips. *P. Clusiana,* another choice member of this group, with brilliant carmine flowers, prefers a soil composed mostly of coarse gravel.

The smallest primrose is *Primula frondosa,* with woolly leaves and tiny lavender flowers. Left to its own devices, it will in time form a carpet good both in foliage and flowers.

Himalayan primrose (*Primula denticulata*), an outstanding species with clear lilac flowers

Culture

Generally speaking, the culture of all varieties is much the same. Primroses need no special pampering if their initial demands are met. They prefer dappled shade, plenty of moisture, and good drainage. Standard treatments for mildews or cutworms can be used on primroses, too. Every two or three years primroses will need dividing if the clumps have grown round and fat.

As to fertilizers, well-rotted cow manure can be used for polyanthus, auricula, and *Primula denticulata*. Leaf mold and humus are sufficient for the remainder of the varieties. Bone meal is used occasionally.

Winter care depends upon the locality. In sections of the country which have a heavy snowfall, there is no need for a mulch. With open winters, a mulch of evergreen boughs should be laid over the beds after the ground has frozen. Another recommended mulch is ice; the plants are hosed with a fine spray during freezing weather until well coated. The use of leaves is inadvisable, as they have a tendency to mat, thereby smothering the plants.

Seeds and Seedlings

The most satisfactory method of acquiring a collection of primroses is to grow your own from seed. Where seed can be secured immediately after harvest time, germination will take place within a week or two. Otherwise the seed must be frozen, given a hot water treatment, or scarified, in order to break the hard, protective seed coat.

Freezing may be done naturally by sowing in cold frames in early winter, to freeze and thaw with the weather. The refrigerator may be utilized for the same purpose: put the seeds into the freezing compartment for a week or two, remove to thaw for twenty-four hours, then back to the refrigerator for another day or two—after which they may be sown.

The hot water method consists of sprinkling the seed boxes in which the seeds have been sown with hot water between 115° and 120° for two consecutive days. This method has produced germination when others have failed. Scarifying is done by scattering the seeds between two pieces of very fine sandpaper, then rotating the paper *lightly* for a few minutes; plant immediately afterward.

For seeds sown in flats a planting medium of ordinary garden soil, sand, and peat is satisfactory. The addition of leaf mold to the soil used in outdoor seed sowing is beneficial. Once the seedlings have acquired their true leaves, they should be pricked out and set into a special bed, another flat, or individual pots, where they can be tended daily until they've reached a good healthy size, after which they may be put into their permanent places in the garden.

With proper care primroses should be an ornament to any garden.

Gottscho-Schleisn

Broad-leaved and needle-type evergreens grow well in this city garden

URBAN EVERGREENS

Some that will really succeed

Paul A. Kohl

Condensed from *Horticulture*, June, 1950

PLANTS, like people, tolerate, but do not thrive under city conditions. This is only too true of evergreens.

In a city with many industrial plants the air is laden with smoke, soot, and chemical and gasoline fumes. Poor soil and the lack of sufficient moisture and sunlight are other limiting factors of good plant growth. Despite all this, however, the air has become better in some cities. During the blackest period of the soft-coal-burning era, evergreens all but disappeared from city gardens; but now, in a clearer atmosphere, many of them can again be grown.

In selecting plants, the question of hardiness must be considered, but the ability of a plant to live through the winter depends a great deal upon good drainage and location. If those two factors are watched, it is often possible to grow plants beyond their accepted hardiness range. Our gardens will also be more interesting if we use broad-leaved and coniferous types in our evergreen plantings.

Needle-leaved Kinds

Pfitzer's juniper (*Juniperus chinensis Pfitzeriana*) is one of the best varieties for city planting. Given a reasonably good soil and water in dry periods, it will respond with good growth for ten or more years. By that time it would be better to replace it with a young plant than prune it with the hope of improving its shape. Where there is need for creeping junipers, there are several types from which to choose: the Andorra juniper (*Juniperus horizontalis plumosa*), a good variety about 2 feet high; the Waukegan juniper (*Juniperus horizontalis Douglasii*); other varieties, such as the Bar Harbor juniper, hug the ground and do not grow more than a foot high.

If a tall, columnar juniper is required, there are a number of types from which to choose. *Juniperus chinensis* var. *columnaris* grows rapidly. Nurserymen offer a number of varieties of our native red cedar (*Juniperus virginiana*). Several desirable forms are *Burkii*, which grows into a dense, narrow column; *Canaertii*, also a tall-growing variety, and *Schottii*, a bushy and heavy-fruiting type.

Japanese yew (*Taxus cuspidata* and variety *capitata*) and *Taxus media* varieties *Hatfieldii* and *Hicksii* grow surprisingly well in the city and tolerate more shade than most evergreens. In the suburbs, yews are effectively used in many gardens as specimen plants and for hedges.

The pines and spruces are less tolerant of city conditions than are the junipers, but beyond the city limits they will grow. White pine (*Pinus Strobus*) is probably the best pine. The Austrian pine (*Pinus nigra*) is also good and in the city appears to be more smoke resistant than the white pine. The small *Pinus Mugo* is used a great deal in foundation plantings, but in time outgrows its allotted space.

The Norway spruce (*Picea Abies*) is frequently planted in suburban gardens. It grows rapidly and retains its shape for twenty or more years. The Tigertail spruce (*Picea polita*) is a slower-growing tree that can tolerate heat and poor soil. The Colorado spruce (*Picea pungens*) is one of the best spruces; many people prefer the blue forms. The Colorado or white fir (*Abies concolor*) does better in cooler climates.

Douglas-fir (*Pseudotsuga taxifolia*) is similar to the first spruce mentioned and grows rapidly.

Branch of Japanese holly (*Ilex crenata*), a sturdy, dense evergreen for gardens in the city

A flowering branch of Oregon-grape (*Mahonia Aquifolium*), a handsome broad-leaved evergreen native to northwestern United States

Canadian hemlock (*Tsuga canadensis*) should be planted in moist soil, shielded from drying winds.

Arborvitae is attractive the first few years after planting but it gradually becomes ragged, and no amount of pruning will restore it to its original shape.

Broad-leaved Kinds

American holly (*Ilex opaca*) does well in city gardens, and in the country grows into a beautiful specimen. It may also be grown as a hedge. The Japanese hollies (*Ilex crenata* and *Ilex crenata latifolia*) grow into dense, evergreen shrubs about 6 feet high, and *Ilex crenata convexa* is a good low-growing holly.

Two choice evergreen barberries are *Berberis Julianae* and *Berberis Sargentiana*. They grow equally well in sun or partial shade.

One sees beautiful specimens of *Buxus sempervirens* in some gardens. Whenever boxwood is planted in a sheltered garden, or on the north side of a building, there is no difficulty in growing it. *Buxus microphylla koreana* is not affected by the average winter, but its leaves turn brown if exposed to the winter sun. When warmer weather returns, the leaves again become green.

Several other desirable foliage plants are the Oregon-grape (*Mahonia Aquifolium*); *Pieris japonica*; firethorn (*Pyracantha coccinea Lalandii*); and the leatherleaf viburnum (*Viburnum rhytidophyllum*).

All broad-leaved evergreens grow better in soil that contains a good supply of organic matter. This should be liberally mixed with the soil when it is prepared, and used as a mulch around the plants throughout the year.

Courtesy Arnold Arboretum

Late honeysuckle (*Lonicera Maackii podocarpa*)

SHRUBS TOLERANT OF CITY CONDITIONS

Based on observations in Chicago

E. Lowell Kammerer

Condensed from *Morton Arboretum Bulletin of Popular Information*, November and December, 1949

MODERN progress notwithstanding, most large cities of today fall far short of providing the conditions essential to satisfactory plant growth; yet nowhere is there greater need for plants and landscape plantings.

To grow in urban areas, a plant must be able to cope with numerous adversities, the most trying of which is polluted air. Chemical and gasoline fumes, smoke, oil, and soot all contribute in producing atmospheric conditions extremely injurious to growth; and the higher the degree of impurity, the more limited the selection of plants able to withstand it. Insufficient sunlight is usually a limiting factor in cities, too, as are also too little moisture, improper drainage, poor soil, and imperfect air circulation. Unlike impure air, however, many of the latter factors may be corrected by the planter, thereby enlarging considerably the range of usable materials.

To refer to a plant as being capable of contending with adversity, however, does not mean that it will grow in any soil (sterile or otherwise), get along without moisture, tolerate poor light, and thrive on neglect. Nothing could be farther

from the truth; for in cities it is doubly important that extra attention be given to all phases of culture, not only to soil preparation but to planting and subsequent maintenance as well. Only by so doing may satisfactory results be expected.

To fill an urgent need for information to aid in the selection of suitable material, a special survey has been made of woody plants growing under urban conditions. Personal observation in various areas of Chicago, from the blighted industrial districts out to the more remote residential sections, has furnished most of the data from which the following list has been compiled. Supplemental information from the University of Chicago and the Chicago Park District has also aided materially in the study.

Flowering almond (*Prunus glandulosa*), 5 feet. Double pink flowers; should be cut back regularly to insure density; best in sun.

Five-leaf aralia (*Acanthopanax Sieboldianus* or *Aralia pentaphylla*), 6 feet. Drouth resistant, shade tolerant, pest free.

Arrow-wood (*Viburnum dentatum*), 10 feet. Fruit has an objectionable odor; tolerant of sun or shade.

Japanese barberry (*Berberis Thunbergii*), 5 feet. Very adaptable. Its spiny branches will catch leaves and papers.

Korean boxwood (*Buxus microphylla koreana*), 4 feet. Foliage evergreen; should have protection from winter sun.

Glossy buckthorn or **alder buckthorn** (*Rhamnus Frangula*), 12 feet. Glossy green, late-clinging foliage; tolerant of soils and exposure.

Nanking cherry (*Prunus tomentosa*), 6 feet. Early white flowers, edible fruit; prefers sun.

Chenault coral-berry (*Symphoricarpos Chenaultii*), 3 feet. Neat habit; prefers shade; adaptable to adverse conditions.

Gottscho-Schleisner

Double-file viburnum (*Viburnum tomentosum*) has a characteristic horizontal branching habit

Cornelian-cherry (*Cornus mas*), 10 to 15 feet. Early yellow flowers; good foliage; tolerates part shade.

Peking cotoneaster (*Cotoneaster acutifolia*), 8 feet. Has glossy foliage; tolerates poor soil; often used for hedges.

American cranberry-bush (*Viburnum trilobum*), 10 feet. Attractive foliage, flowers, fruit; tolerates sun, shade.

European cranberry-bush (*Viburnum Opulus*), 10 feet. Tolerant; foliage subject to aphid damage.

Alpine or **mountain currant** (*Ribes alpinum*), 5 feet. One of the best low shrubs for shade; foliage persistent.

Golden-twig dogwood (*Cornus stolonifera flaviramea*), 5 to 10 feet. Stems bright yellow in winter; foliage subject to aphid damage.

Japanese cornel dogwood (*Cornus officinalis*), 10 to 15 feet. Larger flowers [than *C. mas*]; tolerates part shade.

Siberian dogwood (*Cornus alba sibirica*), 5 to 10 feet. Valued for its red stems in winter; for use only in outlying areas.

American elder (*Sambucus canadensis*), 8 feet. Coarse-textured foliage.

Dwarf winged euonymus (*Euonymus alata compacta*), 6 feet. Fall color brilliant scarlet.

European euonymus (*Euonymus europaea*), 10 feet. Stands part shade; produces decorative reddish fruit with orange seeds.

Winged euonymus (*Euonymus alata*), 8 feet. Withstands city conditions surprisingly well; rose-pink fall color more brilliant in full sun.

Early forsythia (*Forsythia ovata*), 6 feet. Flower buds hardier than those of other forsythias; slower-growing.

Fortune weeping forsythia (*Forsythia suspensa Fortunei*), 8 feet. Branches pendulous; endures the most shade.

Showy border forsythia (*Forsythia intermedia spectabilis*), 8 feet. Large yellow flowers; best in sun.

Fragrant or **winter honeysuckle** (*Lonicera fragrantissima*), 8 feet. Early flowering; excellent foliage clinging until early winter.

Late honeysuckle (*Lonicera Maackii podocarpa*), 12 feet. Late white flowers and red fruit; dark green persistent foliage.

Tatarian honeysuckle (*Lonicera tatarica*), 12 feet. Very tolerant; becomes too leggy for general use.

Snow-hill hydrangea or **hills-of-snow** (*Hydrangea arborescens grandiflora*), 6 feet. Prefers part shade and moisture.

Jetbead (*Rhodotypos scandens* or *tetrapetala*), 5 feet. Very shade tolerant; must be cut back regularly to insure density.

Japanese kerria (*Kerria japonica*), 4 feet. Yellow flowers; green stems in winter; requires good drainage.

Late lilac (*Syringa villosa*), 15 feet. Blooms after the French hybrids.

Common lilac (*Syringa vulgaris*) and horticultural varieties, 12 feet. Useful only in less congested areas; subject to mildew and scale.

Japanese tree lilac (*Syringa amurensis japonica*), 25 feet. White flowers in late June; tolerant of drouth.

Virginal mock-orange (*Philadelphus virginalis* "Virginal"), 6 feet. Fragrant semidouble white flowers; tolerant.

Mountain ninebark (*Physocarpus monogynus*), 4 feet. Compact habit, tolerant of sun or shade.

Siberian pea-shrub (*Caragana arborescens*), 10 feet. Prefers sun, light soil; free from diseases and pests.

Amur privet (*Ligustrum amurense*), 8 feet. The most dependable privet for hedge use; tolerant of soils and exposure.

Common or **European privet** (*Ligustrum vulgare*), 10 feet. Its foliage remains green very late in the fall; very tolerant of city conditions.

Ibolium privet (*Ligustrum ibolium*), 6 to 8 feet. Very glossy foliage; not so hardy as the others.

Regels privet (*Ligustrum obtusifolium Regelianum*), 10 feet. Interesting horizontal habit; tolerant of shade; indifferent as to soil.

Japanese quince (*Chaenomeles lagenaria*) in variety, 6 feet. For use in outlying areas; prefers full sun.

Japanese rose (*Rosa multiflora*), 6 feet. Of sprawling habit; red fruit decorative; prefers sun.

Memorial rose (*Rosa Wichuraiana*), 1 foot. Naturally procumbent [lying on the ground or trailing]; may be trained as a vine; glossy foliage, white flowers; sun.

Russian-olive (*Elaeagnus angustifolia*), 20 feet. Foliage silvery gray; good in light soils.

Anthony Waterer spirea (*Spiraea Bumalda* "Anthony Waterer"), 3 feet. Raspberry-pink flowers in midsummer; must be trimmed to be kept bushy.

Gottscho-Schleisner

In midtown New York, several adjacent property owners have pooled their efforts in this garden

Vanhoutte spirea (*Spiraea Vanhouttei*), 6 feet. Tolerant of city conditions; must be trimmed to be kept in shape.

Cutleaf staghorn sumac (*Rhus typhina laciniata*), 15 feet. Picturesque in habit; for use in less congested areas.

Fragrant sumac (*Rhus aromatica*), 6 feet. Must be cut back periodically; catches papers and leaves.

Smooth sumac (*Rhus glabra*), 15 feet. For use in less congested areas.

Staghorn sumac (*Rhus typhina*), 20 feet. For use in less congested areas.

Burkwood viburnum (*Viburnum Burkwoodii*), 8 feet. Semi-evergreen foliage.

Double-file viburnum (*Viburnum tomentosum*), 8 feet. Interesting habit of growth; best in sun; demands perfect drainage.

Korean spice viburnum (*Viburnum Carlesii*), 6 to 8 feet. Very fragrant flowers; intolerant of drouth.

Let's Go Shopping for

Condensed from *The American Home*, June, 1950

THERE are some 900 species of *Rhododendron*, and more than 2,000 named varieties, including many hybrids. Some of them are properly called azaleas, for, botanically speaking, all azaleas are a special kind of rhododendron. To put it simply, all the common rhododendrons have thick, leathery evergreen leaves; while the common or typical azalea has thinner leaves which often are shed in the fall. There are many "borderline" forms.

In general, given suitable conditions, these plants are really easy to grow. But they are highly specific in their requirements. Indeed with their cousins, the blueberries, mountain-laurel, heather, trailing arbutus, and some other excellent plants, they constitute a family group (the Ericaceae) known as the "heaths." A common characteristic of all of them is that they absolutely require an acid soil in order to thrive. Lime and nitrate of soda, commonly applied, cause an alkaline condition and are veritable poison to them.

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Rhododendrons and Azaleas

CLEMENT GRAY BOWERS

Without doubt, some of the most gorgeous of all woody plants are found in this group. Picture a huge evergreen shrub, 60 feet tall and equally broad, literally covered with bright red flowers almost the size of cabbage heads. Such is the grandeur of the rhododendron as it may grow on the West Coast of this country. Even in our rugged Northeast, a considerable amount of this spectacular beauty is available in these plants, although on a much smaller scale. And for our South, can anyone who has seen the spring glory of azaleas from Norfolk to Florida and west to Mobile, ever forget their blaze of color? Even around Boston, and Rochester, N. Y., deciduous azaleas can make a wonderful show.

Unless you live in an arid climate or a region of highly alkaline soil, some kind of rhododendron or azalea will probably grow for you. If yours is a region of mild winters and moderate summers, with a light, acid soil and abundant atmospheric moisture, you are probably already growing them. Conversely, these plants do *not* like the hot, dry winds of the desert or the frigid winter blasts of the northern plains.

For the Northeast

The kinds that are safe for New England are mainly older sorts; few modern hybrids are of the "ironclad" type. The Catawba hybrid list in the table (page 224) is based upon years of trial at the Arnold Arboretum near Boston, and elsewhere. Few new kinds for this region have appeared since 1880, but most of them are still beautiful even though regarded as obsolete in England and elsewhere. Perhaps more possibilities exist for the cold Northeast among the deciduous azaleas than in any other class. When grown on their own roots and given adequate water in early summer, they will flourish and survive a surprising degree of winter cold. Unthriftiness in summer generally means injury or death during the subsequent winter, and grafted azaleas are subject to such troubles. The deciduous azaleas are not often as floriferous as the evergreen sorts or those commonly grown southward, and their faded flowers should be removed if annual bloom is expected. But, ranging in color from white through rose to scarlet, orange, and yellow, with many intermediate shades, they can be almost as spectacularly beautiful as some of the more tender southern kinds. The Ghent and Mollis azaleas contain some tender "blood," yet many are perfectly hardy when grown on their own roots. Unfortunate experiences with grafted plants have given them an unwarranted reputation for tenderness.

Cultural Requirements

Shade, wind, and moisture. Rhododendrons and azaleas are shade tolerant, but do not thrive or bloom well in complete shade. The spotty sun-and-shade floor of an open oak grove suits them perfectly. They also prefer shelter from strong winds, and like air drainage. You can grow them in many places—on hillsides, in the partial shade of buildings, even in full sun if the site is not dry or hot and if you mulch them heavily. But south slopes, the south side of buildings, windswept spots, and drafty corners should all be avoided. The "high shade" of big oak or pine trees makes an ideal site; but don't put them near maples or elms, whose extensive surface roots compete with the rhododendrons for soil moisture.

In the North or Middle West the best time to plant is in the spring—April or May. The plants need well-drained soil: guard against clay subsoil or any condition that might cause water to stand about their roots. At the same time, they will not tolerate dryness. An ideal rhododendron soil is physically like a damp sponge —moist and fibrous to the touch, but full of air spaces, too. This is best achieved by the liberal use of peat, fibrous leaf mold, or sawdust, separately or in combination. Do not use muck (which is often alkaline) or buckwheat hulls. Sphagnum peat and Michigan sedge peat are excellent if acid in reaction.

Acidity. If a soil is not sufficiently acid, the best way to make it so is to add acid peat (up to 100 per cent if you like). Aluminum sulphate has been advocated as a soil acidifier, but continued use is apt to leave a toxic residue of aluminum salts. Powdered sulphur—not more than 1 pound to 100 square feet of area—is considered preferable. Or you can use an organic acid, such as tannic acid, in very dilute solution. In any case, test the soil to know just how acid you are getting it.

If you live where the water is "hard," don't use it for watering, but depend on the rains and conserve the soil moisture by maintaining a year-round, very heavy mulch. For best results, rhododendron soil should test pH 4.5 to 5.0 in the chemical acidity rating, in which pH 7.0 is neutral.

Planting, mulching, and fertilizing. Since rhododendrons and azaleas have shallow root systems, deep soil preparation is unnecessary except to provide the all-important drainage and aeration.

McFarland photo

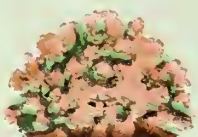
Pinxter-flower (*Rhododendron nudiflorum*)

In planting, place a 4- to 8-inch bed of peaty soil in the hole, set the plant at about the depth it grew before, fill in with the peaty mixture, and water thoroughly. A mulch tends to keep the soil cool and moist. Use oak leaves or pine needles if possible; sawdust and peat are good but should be covered with leaves so they will not get so dry that rain runs off instead of soaking in. Oak leaves are acid and remain so a long time; the thinner leaves of maple and elm disintegrate rapidly. Pile on the leaves in fall up to 8 inches deep and leave them there, adding a fresh layer every year. As they break down they furnish valuable nutrients. In any case, do not use ordinary fertilizers, but special kinds made for acid-loving plants. Ammonium sulphate and acid phosphate, applied lightly, are suitable; also rotted manure if the soil is acid enough to stand the ammonia it contains. A successful formula is 1 part potassium nitrate to 2 parts acid phosphate (superphosphate) mixed and applied in early spring at the rate of half a pint around each 3-foot plant.

Given the above initial care, rhododendrons and azaleas will require almost none thereafter. Never cultivate them, for their roots are shallow and fine. Except in the South, where azalea flower-spot is prevalent, neither insects nor diseases give much trouble, and they are usually controllable by the use of ordinary insecticides and fungicides. The rhododendron lace-bug, which is occasionally troublesome, calls for spraying with nicotine sulphate or a good rotenone-pyrethrum preparation.

A. New England, Central New York, Northern Pennsylvania, Ohio, westward (including Michigan) to Central States

B. Middle Atlantic States (inc. Metropolita New York, Philadelphia, Washington Virginia, No. Carolina, and westward inc Kentucky, Tennessee, and the mountain southward; also mild Coast areas—Cap Cod southward

Classes and Types		*Species and Na*
Large Evergreen Rhododendrons (6 feet and over)		R. catawbiense, R. maximum, and forms s h Album Elegans, Album Grandiflorum, Ch es Catawbiense Album, Everestianum, Lady Sargent, Purpureum Grandiflarum, Rose Other Catawba hybrids, R. panticum, the and its hybs. such as the Dexter hybs. (so R. thamsoni, griffithianum, fortunei, aur Britannia, Earl of Athlone, Purple Splen Loderi and Loderi hybs., esp. Laderi Kin
Medium Evergreen Rhododendrons (Generally under 6 feet)		R. carolinianum, minus, smirnawi, catawb R. micranthum Hybrids such as Baule de Neige, Henriet and Wilsoni and others. Cunningham's White R. chapmani R. augustini (Tower Court farm), R. camp var. Raylei, griersanianum, haematades, Hybs. including Azor, Butterfly, Fabia, L May Day, Romany Chai, Temple Belle, a
Deciduous Rhododendrons and Azaleas		R. arborescens (white), calendulaceum (cumberlandense (orange, scarlet), nudif roseum (rose), viscasum (white), vaseyi R. japonicum (salman, yellow), molle (a R. schlippenbachi (light pink), poukhan kaempferi (bright salmon-rose), mucron R. luteum (yellow), accidentale (white an (bright magenta), reticulatum (white), G R. austrinum (yellow, orange), canescens (red, orange, yellow), serrulatum (white), R. occidentale (white, with yellow blotch)
Evergreen Azaleas		R. poukhanense (lilac), kaempferi (red). R. obtusum, large Kurume azaleas (whit (white), indicum (red), malvaticum, Glen R. phoeniceum (magenta), simsi (red), s Indian Hybrid Azaleas, Macrantha hybs
Dwarf Rhododendrons and Azaleas (under 3 feet)		R. atlanticum (white, pink), canadense micranthum, racemasum; R. Wilsani an Kurume and Malvatica azaleas, Glenn R. hippophaeaides and passibly some R. triflarum, ledoides, williamsianum an Temple Belle, Bow Bells, Blue Tit and ot

l for Regions in the Table

. The Lower South—Charleston, S. C. to Florida and westward through Alabama to the Gulf of Mexico

D. The West Coast, from San Francisco northward through Portland and Seattle to Vancouver and Victoria

	Regions	Characteristics and Notes
Atrosanguineum, ckens, Caractacus, ong, Mrs. Chas. jans.	A B C	Color range from white through blush and pink to rose, crimson, and lilac. Besides those named, many hardy seedlings and old-time named vars. are available.
inei group grant).	B C	Good in the New York City and Philadelphia areas; some may be hardy northward.
n, and others. ynthia, others. ge and Venus.	D	All grow well in Pacific Northwest. A few may prove hardy in Region B. For larger list for West Coast, consult regional nurserymen. Wide range of colors; many brilliant.
var. compactum. ent, Myrtifalium	A B	Colors, white, light pink, lilac. R. micranthum with tiny white flowers is not handsome in bloom; leaves small, evergreen. Growth habit of these hybs. tends to be compact.
	B	An early blooming white hybrid.
	C	A native of Florida, very much like R. carolinianum.
um, cinnabarinum lium, wardi. amberlain, ny others.	D	These include a vast array of forms and many additional species. Colors range from almost blue to bright red and clear lemon-yellow. Some of the hybs. have intermediate shades, as salmon-rose. Some hove peculiarly shaped flowers.
orange), light pink), yellow). lac), (lilac-purple).	A B C D	Native American azaleas, hardy even in sub-zero climates. Height ranges from 3 to 12 feet or more. Flowers are under 2 inches in diameter, except in japonicum and molle which ore usually more than 2 inches across. Kaempferi will not succeed where temperature goes 15 degrees below zero.
w), pentaphylum d mollis hybs.	B C D	Ghent and Mollis hybs. vary in hardiness. The true occidentale is not very hardy.
pink), prunifalium sum (red).	C	Native azaleas of the Lower South, generally unsatisfactory north. Much like the northern wild azaleas in character.
	D	There are some excellent forms and hybs. of this species.
	A B C D	Semi-evergreen in the North; evergreen in the South.
lilac), mucronatum and Gable hybs.	B C D	Some Kurume azaleas grow to 6 ft. Untested Glenn Dale hybs. may prove hardier and better than Kurumes.
(scarlet), itica hybs.	C	The large Indian azaleas and their allies, famous in the Lower South; not hardy in the North.
ivender), olium (hybs.).	A B	R. atlanticum is a coastal species, 18 in. tall; the white form is best. R. canadense is the Rhodora. Both are deciduous.
os. in small forms. ental species.	B C	Several types of dwarf Japanese azaleas do well in the South.
s. s.	D	There are many dwarf evergreen rhododendrons from Asio in many colors from blue to red and yellow.

AIR LAYERING RHODODENDRONS

To increase those "difficult" kinds

James S. Wells

Condensed from *The Home Garden*, June, 1950

THE art of plant propagation is an intriguing and fascinating subject and one at which any true gardener will sooner or later try his hand. While in general it is not easy to propagate plants successfully, the so-called "trade secrets" are really nothing more than the very careful application of well-known principles.

There can hardly be one of us who has not at one time or another run across a particularly fine rhododendron from which we have wished we could take a few slips. It is possible for you to propagate a few plants of a rhododendron with comparative ease. It is done, not with cuttings, but by "air layering."

Air layering is nothing new; the Chinese propagated plants in this way thousands of years ago. But we do have a few modern refinements which make the method more widely applicable and simpler to carry out.

McClelland: Seabrook Farms photos

To stimulate rooting, the cane is notched almost to the center and dusted with a hormone powder

Materials

First, obtain a small quantity of sphagnum moss—collect it green from the woods or buy it dry from the florist—about half a bushel. Then you need a small jar of Merck's Hormodin No. 3, a root hormone powder. You can use others, but we have found this to be the best. Finally you will need some squares, measuring approximately 12 by 12 inches, of any of the new sheet plastics. Cellophane is no use; you need some of the stronger and tougher types, such as Koroseal or DuPont Polythene. This last is excellent; but obtain whatever you use in the transparent colorless grade.

Preparation

Select a clean young stem on the plant that you wish to propagate. An area clear of leaves is required, and you will, therefore, have to work below the top growths down into the two-year-old wood. With a sharp knife cut a thin slice from the stem. Cut through the outer tissues of the stem into the central woody portion, but do not remove the slice. Then dust on a generous dusting of the hormone powder, being sure to cover *both* cut surfaces.

The "layer" is now ready for the moss. A generous double handful is carefully wrapped around the wound which you have made on the stem; take care to push a small amount of it into the cut, to keep it from closing. The moss should be well and evenly damp but not so wet that you can squeeze water from it freely. Having carefully molded the moss so as completely to cover the wound, wrap the moss in turn in the plastic sheet, which should be large enough to allow for a generous overlap. It now remains only to fasten this, top and bottom, firmly to

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the stem with string, or better still, a broad rubber band or a budding strip. Wind the band around the plastic, firmly but not too tightly, and tuck the end under the last turn.

Rooting

All that is now required is that you sit back with all the patience you can muster to await results. The process of rooting is not a quick one. If you can make your layers any time from the middle of April to the middle of July, you can expect some of the layers from your early treatments to be well rooted into the moss by the first of October. All should be well callused, and any not rooted at that time should be left undisturbed through the winter; they will probably root late the next spring.

Although it is very tempting, do not touch the plastic covering, once it is on, until you check all of them in October.

The prepared notch has been stuffed with moist sphagnum and the cane wrapped in a fist-sized ball of the moss

The ball of sphagnum is then wrapped in durable, moisture-trapping plastic

Planting

If you have the correct type of plastic, tightly fastened, the moss will remain moist indefinitely and may turn green and grow beneath the covering. Roots will come from the wound and run through the moss.

Any plants found to be rooted by October should be removed from the parent plant. Cut cleanly with a sharp pair of pruners just below the moss ball. Very gently break up the outside layer of this moss ball so that some of the roots are free from the moss; then plant the rooted plant in a frame, or in some similar protected area, in a good acid mixture of peat moss and topsoil. Although it is necessary to break up the moss ball slightly, great care must be taken with this operation, for the roots at this stage can easily be broken loose.

Keep the frame tightly closed until new root activity is seen. Syringe lightly each day for the first two weeks, especially if the weather is hot. It is important to

encourage the young plants to make new roots in the frame as rapidly as possible. The final result the following spring should be a first-class plant, 12 to 15 inches high, with three to four branches and a fine ball of roots, which can safely be planted into its permanent quarters in the garden. Early April would be the best time for this move.

Kinds

Practically all varieties and types of rhododendrons and azaleas will respond to this method of propagation. The hardy Ghent azaleas can be successfully rooted by air layers, as can the more difficult red-flowering varieties of rhododendrons. Varieties will differ, however, in their response. All the Catawba types of rhododendrons will root with comparative ease, as will varieties such as *Rhododendron roseum elegans.* Some of the softer varieties, such as Pink Pearl, also will root well; but the hard dry red varieties, such as Dr. Dresselhuys, America, Kettledrum, and E. S. Rand will be some of the most difficult. With these you can expect to root perhaps 50 per cent of your layers but on the more easily rooted varieties 70 per cent or even 80 per cent.

McFarland photo

Mountain rose bay (*Rhododendron catawbiense*) is easily propagated by air layering

FEEDING PLANTS THROUGH THE LEAVES

Practical for the home gardener

P. P. Pirone

Condensed from *Popular Gardening*, May–June, 1950

THE idea of applying nutrients directly to the leaves, instead of the familiar method of adding them to the soil, seems new to most people. For many years, however, plants such as azaleas, pin oaks, and pineapples, with yellowed leaves caused by an iron deficiency, have been sprayed with iron salts to cure the condition. It has long been known that a zinc spray would correct a lack of zinc in citrus leaves and that the "rabbit-ear" disease of lettuce could be corrected by spraying the leaves with copper.

What is rather new is the fact that a form of nitrogen (urea) as well as a complete chemical fertilizer, when dissolved in water, can be sprayed safely on the foliage of many kinds of trees, shrubs, and ornamental plants to produce dark green luxuriance.

Much of the credit for this revived interest in foliage feeding should go to the Cornell University fruit specialists who cooperated with the DuPont Company in the development of urea sprays for apples. The Cornell workers have used the urea compound, sold under the trade name NuGreen, to supply the nitrogen needed to keep apple trees in good vigor.

It has been determined that nearly half of the nitrogen thus applied is absorbed by the plant leaves within an hour after application. The nitrogen thus absorbed starts to nourish the tree immediately. Apple leaves formerly deficient in nitrogen become darker green within a few days. Of course, one application of NuGreen will not be sufficient to supply the tree's nitrogen needs for the whole season. As many as three or four applications at periodic intervals are necessary.

The orchardist can add the nutrients directly to the spray tank containing pesticides and thus do two jobs at once.

The Rapidgro Corporation, manufacturers of a completely water-soluble chemical fertilizer with an analysis of 23–21–17, has long advocated spraying fertilizers directly to leaves. Its formula contains all the essential minor elements in addition to nitrogen, phosphoric acid, and potash. The nitrogen in this formula is carried as urea.

Few reports have appeared in horticultural literature on the use of either NuGreen or Rapidgro on ornamental plants under controlled conditions, but results with roses and chrysanthemums have been so striking that they should be described here.

Roses

The tests on roses were conducted in the greenhouse from March to May, 1949. Twenty-four dormant, 2-year Red Radiance bushes of uniform size served as "guinea pigs." Each was potted in a 10-inch clay pot (filled with a mixture of half sand and half soil) in February and placed in the greenhouse. When new growth became well advanced a month later, the first application of nutrients took place. Some of the bushes received NuGreen at the rate of 1 pound in 20 gallons of water, others received Rapidgro, 1 pound in 30 gallons, and others were not sprayed with nutrients. The tops of the pots were covered with cardboard to prevent nutrients from dripping back into the soil.

Beginning with the third weekly application, it became obvious that those

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Fed through the leaves, the rosebush on the left received Rapidgro; untreated shrub on the right

New York Botanical Garden photo

sprayed with NuGreen and Rapidgro would make the best plants. The foliage in both treatments looked darker green and generally more luxuriant than on the controls. By the time the fifth and last application was made, the results were even more striking. In addition to better foliage, plants treated with NuGreen averaged ten buds, and those treated with Rapidgro had eight buds, whereas untreated plants averaged only six buds per plant. A comparable increase developed in the number and length of stems on the treated as compared with untreated plants.

A combination insecticide-fungicide spray containing Fermate, DDT, rotenone, and sulfur was mixed with the nutrients in two of the five applications. This mixture was found to be compatible.

Chrysanthemums

The results with both indoor and outdoor chrysanthemums were even more striking, perhaps because the rougher leaves on these plants wetted more easily and thus enabled more of the nutrients to enter.

The tests on the indoor chrysanthemums warrant special mention. In these, thirty-six plants of the cascade variety Jean Hart were obtained from a single stock plant to eliminate seedling variation. Each plant was trained on slanting wires so that it grew to the side of the pot, thus eliminating the possibility of the spray's dripping back into the soil.

After rooting, each cutting was planted in a large pot containing soil of average fertility. Once established, twelve of the plants were sprayed six times at weekly intervals with NuGreen, twelve with Rapidgro, and twelve were left unsprayed.

The difference in foliage size and color soon became obvious. By the time the tests were completed in early October, the unsprayed plants showed yellow leaves, particularly on the lower stems, and the upper foliage looked only fair; whereas the plants sprayed with NuGreen and Rapidgro had larger, deeper green foliage. Some of the leaves treated with NuGreen showed a very slight marginal burn; those with Rapidgro showed none. None was noted on outdoor chrysanthemums sprayed with NuGreen.

Other Plants

Numerous other tests on outdoor chrysanthemums, as well as on various ornamentals grown both indoors and out, convinced me that this is a way the average gardener can improve the quality of his plants without greatly increasing cost. The home gardener can add the proper amount of nutrients to the spray tank and thus achieve pest control and obtain more vigorous plants at the same time.

Perhaps the greatest use of foliage feeding in the future will be for shade trees growing along city streets, where, because of impervious pavements beneath them, fertilizers cannot be added to the soil.

Gottscho-Schleisner

Fashion, one of the loveliest of the new roses for cutting

THE ROSE AS A CUT FLOWER

Factors that determine its keeping qualities

N. P. Harvey

Condensed from *The Gardeners' Chronicle*, Oct. 14, 1950

HYBRID Teas show considerable variation as regards keeping qualities. Two of the best Hybrid Teas for decorative purposes are Crimson Glory and Home Sweet Home. Crimson Glory is often temperamental in the garden, but indoors it retains color, shape and stiffness of stem for some days. It is a very easy variety to arrange, despite an excessive armament of thorns! Home Sweet Home has never been as widely grown as it should be. The pure pink, cupped-shaped flowers are usually borne in sprays, and are just as attractive in the bud as when full blown. The color is superb under artificial light.

Sutter's Gold, the best of the American varieties for cutting, has pale yellow flowers

McFarland photos

Number of Petals

The more petals a rose has, the longer it generally lasts, whether on the plant or when cut. The number of petals is not, however, an infallible guide, since Else Poulsen and Karen Poulsen last as long as very full varieties like Dame Edith Helen, Golden Dawn or Mrs. L. B. Coddington. Singles and semi-doubles are excellent for decorative purposes if cut in the bud stage. Varieties which are neither single, semi-double nor very full, but intermediate as regards number of petals, often collapse a day or so after cutting. Examples are Charles Gregory, McGredy's Yellow and Grande Duchesse Charlotte. There are some exceptions to this rule. Although President Herbert Hoover and the newer cerise-red Rubaiyat have insufficient petals, both open fairly slowly.

Many fairly full roses have short center petals which means that the blooms open too quickly. This is still characteristic of many of the multi-colored varieties such as Angèle Pernet, Condesa de Sastago and Dickson's Perfection. Flat-topped or cupped sorts may, however, keep well if they have plenty of petals—Catalonia is a typical example. Varieties with high-pointed centers only last properly if they have sufficient petals. Thus McGredy's Triumph is not a good cut flower, as the high-pointed center falls in

Gordon Eddie, a Canadian variety which is exceptionally long-lasting when cut

rapidly owing to the paucity of petals. Varieties with loosely-shaped blooms like Angels Mateu do not last well.

Many such varieties have other qualities which tend to compensate for their failings. The Doctor holds its color until the petals drop, irrespective of weather conditions. The same is true of the neglected Cynthia Brooke. This fine coppery-yellow has globular shaped blooms with very short petals throughout. Peace, another good variety, tends to open rather rapidly, but the full-blown flower is attractive for several days. McGredy's Sunset has short center petals, but is also an exceptionally good keeper, not least because it possesses the rare virtue of intensifying its color as the blooms expand.

Color

Most white, cream, and yellow roses last well in water; indeed, whites often seem to become whiter and yellows deeper in color. Pinks are generally very satisfactory, although deep pink and carmine-pink varieties sometimes "blue." Some crimsons and scarlets also tend to fade. The multi-colored Hybrid Teas, provided they are not too thin, usually hold their color well.

Time of Cutting

Experiments conducted at Cornell University proved that greenhouse roses cut

in the late afternoon last longer than those cut in early morning. A report on these experiments in the 1945 Annual of the American Rose Society suggests that the increased sugar and starch content of the leaves during the afternoon is responsible.

Length of Stem

It is not advisable to cut with very long stems except on really vigorous, established plants. In no circumstances cut long from newly-planted or weak trees. If one ignores this warning, the plant will be deprived of foliage destined for manufacturing food, and its vigor reduced. With some varieties, such as Ophelia and her many sports, foliage is rather sparse at the top of the stem, so it is quite safe to make a long cut. On the other hand, a rose like McGredy's Sunset, which carries foliage right up to the base of the blooms, might be severely weakened by such treatment. Avoid cutting into old wood, as this does not absorb water as readily as the young growths.

Care

When gathering blooms, it is always best to plunge the roses to their necks in a pail of water. They should then be left in a cool place for an hour or two so that they can absorb plenty of water. Deep plunging also lowers the temperature of flowers, leaves, and stems. Contrary to popular opinion, it is unnecessary to remove thorns, since water is almost certainly absorbed mainly through the slanting cut at the bottom of the stem, and not through the leaves. For the same reason, it is a waste of time to bruise or split other parts of the stem. Remove the lower leaves; they may decay in water, thereby encouraging bacteria.

Chemicals

Dressings of potash [on the plant] in late winter or early spring are said to increase keeping qualities of flowers, presumably because potash has a hardening effect. From time to time various substances are claimed to increase lasting qualities—aspirin is perhaps the most familiar. Some twenty years ago the Boyce Thompson Institute in New York tested fifty chemical compounds, but none was found really satisfactory.

Notes on New Varieties

Among the Americans the orange-pink Charlotte Armstrong lasts well, as the bloom is large, with plenty of petals. The color sometimes fades to an unpleasant shade as the blooms age, although this seems less noticeable outdoors. Juno and Show Girl are two more pinks that keep well, the latter opening fairly slowly, despite insufficient petals. Tallyho is a very good grower in my garden, but the carmine-rose blooms are of poor shape and a somewhat ordinary color. Like all varieties with carmine, cerise, or magenta in their make-up, it is best under artificial light. In my experience the best of the American varieties for cutting is Sutter's Gold. The vivid reddish-gold buds open to pale yellow flowers. They are richly scented.

Two Canadian novelties must be mentioned. Flaming Sunset, deep orange, with lighter reverse, one of several sports from McGredy's Sunset, has all the good qualities of its parent. Gordon Eddie is a very pleasing salmon-buff, with large, high-centered flowers. The color holds till the petals fall, and it seems exceptionally long lasting when cut.

Among the English varieties, Admiral is an excellent salmon-pink. Dorothy Anderson is another good pink, after the style of Mrs. Henry Bowles but softer in color. Ena Harkness and Red Ensign are surely known to all enthusiasts, likewise Frensham. They are all first-rate for cutting. Gay Crusader is a red and yellow bicolor which seems promising. The loveliest of the new roses for cutting is Fashion. The color is the same in all weathers and there is no bluing. The only drawback is that by reason of its unique color, it should stand in splendid isolation.

A BROADSIDE AGAINST BILLBOARDS

To protect scenery

Robert Moses

Condensed from *The New York Times Magazine*, Nov. 12, 1950

WE must focus attention on uncontrolled advertising on our highways and decide whether express arteries traversing scenic areas and fine architecture are to be defaced by billboard companies on behalf of selfish advertisers, or protected for the enjoyment of the people who pay for them. As matters stand, we are in most cases building gasoline gullies running between almost continuous barricades of monstrous billboards.

Our governments acquire express rights-of-way without traffic lights and with access only at important crossings. They build bridges. They landscape and light. They open vistas. They spend from $500,000 to $5,000,000 a mile for land and construction. Then the billboard boys blot out the vistas with their raucous canvases and claim they are entitled to do so by law, equity, and morality! Effrontery and impudence could go no farther.

Many public improvements are in the making—parks, landscaped parkways, magnificent bridges, huge housing developments to take the place of slums, modern buildings of all kinds, as well as superhighways. If the investment of the people in these improvements is to be protected and the value of our scenery preserved, drastic measures to curb the blight of outdoor advertising are indispensable.

Although this plague stems chiefly from efforts to sell somebody's product or to call attention to Bill's hot-dog stand, the hucksters are not the only offenders. The politicians are at it too. Splashing electioneering marks with paint on conspicuous surfaces is a new device. We are beset by the official billboard planted by public officers, usually shortly before elections, not to explain an improvement under way or ward off uninformed criticism, but to claim credit for what scores of people have produced with public funds.

These practices have become sheer vandalism. Officials and prosecutors under heavy political pressure do very little about it; and whatever they do has no effect, once the election is over. For months afterward, tattered bills and weathered fence writings continue to proclaim that Joe Zilch, who would otherwise have faded into oblivion, is fat and fearless, loves the voters, built the Seven Wonders of the World with his own hands, and is solemnly dedicated to public service.

Their Defense

The outdoor advertising interests have attempted to play down the seriousness of the blight they create. They would like us to believe that it is only a few esthetes and what they derisively call "garden club gals," who object to billboards. They piously insist that their work is artistic, as well as ingenious and arresting; that they love our native rocks, rills, and templed hills; that they are patrons of fine architecture and dedicated to all beauty; that they provide indispensable services; and above all, that they are interested in the comfort and safety of drivers on the highways. To prove their interest in safety they erect at a busy intersection a billboard on which is found the admonition "Drive carefully."

Need of Laws

The time for compromise with these ruthless people is over. They must be drastically controlled by law and law

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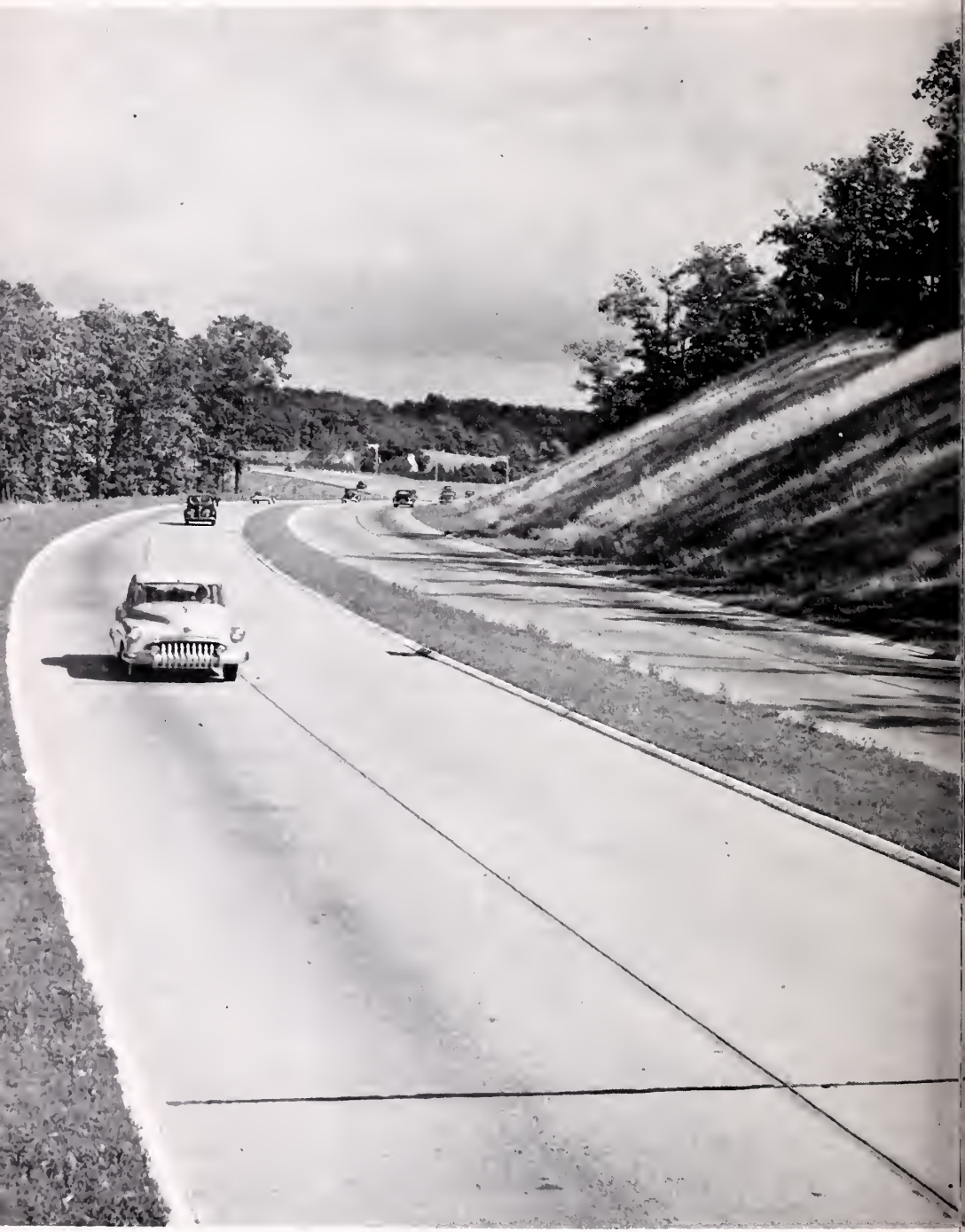
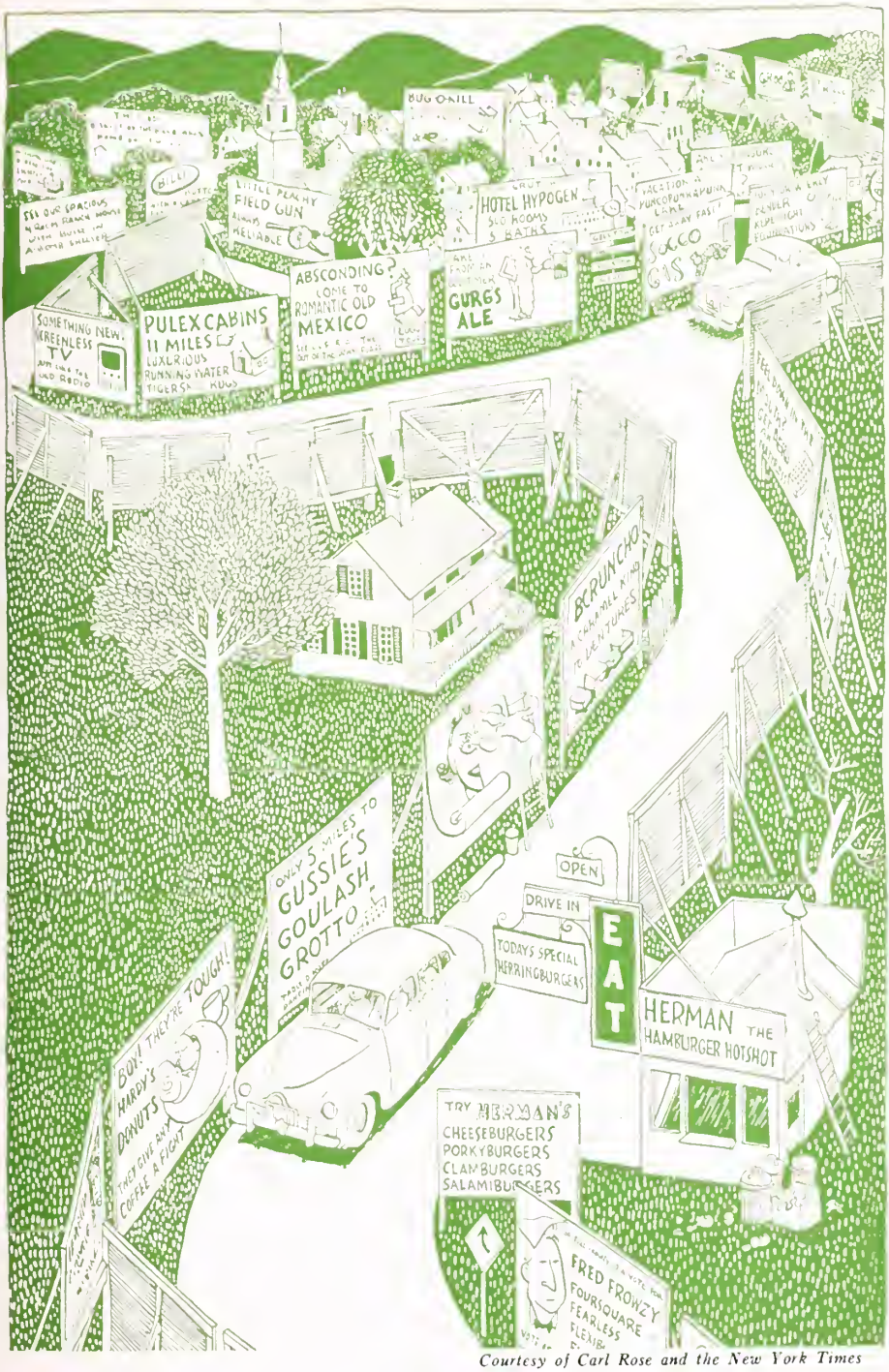


Courtesy Long Island State Park Commission



Courtesy of Carl Rose and the New York Times

enforcement. Fortunately, there are plenty of legal precedents for controlling them. Courts have repeatedly recognized that the billboard is essentially an intrusion, that it causes annoyance to the traveling public, and that its exclusion from parks and parkways and from regions of natural beauty or historic interest is within the reasonable bounds of the police power.

The parasitic nature of outdoor advertising has been pointed out in numerous decisions. In 1943 the Supreme Court of Vermont, in upholding a law requiring billboards to be set back from the highways, ruled that a setback statute does not impair the "'right" of a commercial outdoor advertiser because there is not any such right.

The billboard industry, which is politically powerful, never gives up the battle. And it usually wins. When a regulatory bill is offered in the Legislature the billboard people call in their representatives, lobbyists, and lawyers; marshal farmers and labor leaders; and round up their roadside operators. They stir up the unions to oppose control on the theory that thousands of signboard painters will instantly lose their jobs and be sent to the relief rolls. Farmers are told that they may put their sons through college on billboard rentals.

The industry's cleverest strategy, and by far the most successful in warding off statutory regulation, has been its expansive offer of "cooperation" and "voluntary agreements" with public officials. The outdoor advertisers insist that cooperation in the true American tradition will accomplish more than legislation, and ask to be allowed to police themselves. Contrary to their claims, the record proves that cooperation does not exist and that self-policing is a farce.

Accomplishments

Efforts to combat this plague in New York State have been made on two levels —statewide and local. Accomplishments by the state itself have been meager indeed. Local efforts at control, however, have produced somewhat better results. Much has been accomplished by including restrictions on outdoor advertising in local zoning ordinances.

In other states some local units of government by separate action, but with singleness of purpose, have been able successfully to control advertising signs on long stretches of highways. The Merritt Parkway in Connecticut is protected by the zoning ordinances of the several towns through which it passes. In California the roadside zoning ordinances of three separate counties have kept sixty miles of the Scenic Skyline Boulevard down the crest of the Santa Cruz Mountains virtually free of billboards, and by severe restriction on the location and use of roadside service businesses, have protected this stretch of beautiful highway from hot dog stands, cheap roadhouses, and sign-splashed gasoline stations.

All these efforts give no promise of curing the billboard plague, because of the limitations imposed on local controls. The counties do not possess the general power to enact zoning ordinances. The Legislature has given that power to cities, towns, and villages, only.

The Remedy

What can we do to set up effective regulation of an obviously irresponsible billboard industry?

The first step here in New York is to protect legally the new state thruway before it is too late. The next step is to enact a general state law regulating outdoor advertising outside of cities and villages.

Such effective control is the only answer for the public officials and for the outdoor advertisers themselves. The billboard industry in the long run must operate within a legitimate framework, learn what it can and cannot do, and behave on the assumption that the public interest is paramount.

LOUISIANA'S GIFT TO GARDENS

Beautiful big hardy irises

Caroline Dormon

Condensed from *Bulletin of The Garden Club of America*, Nov., 1949

WHILE botanists and horticulturists were covering Europe and Asia in search of new species for American gardens, irises with enormous flowers in flaming reds, clear yellows, and warm pinks, were growing at our doorstep!

Until recent years, irises in gay colors grew within the city limits of New Orleans. Happily, a few observant persons in and about New Orleans took up plants and brought them into their gardens. These would have been lost, otherwise, for the places where they grew are now completely built up.

It took years of patient collecting and selecting, of growing them in many places and under various conditions, to convince gardeners that here was something of horticultural importance. At first sight, they were entranced with their beauty, but were skeptical of a bog plant succeeding under garden conditions. Now they are seeing, and skepticism is vanishing.

Several years ago, a few enthusiasts organized a Society for Louisiana Iris, with headquarters at Southwestern Institute, Lafayette, Louisiana. Here a meeting is held each spring, with an iris show—native species only.

Species

There are three species which seem to be accepted by all. *Iris fulva* really occurs in several states. The type is small, drooping, dull red; but in recent years forms have been found in Louisiana that have larger, firmer flowers, and in shades of crimson, pink, and clear yellow.

The type *Iris foliosa* is low-growing, with flat, bright lavender-blue flowers almost hidden by leaves. But it, too, has evolved here in the rich flood plain of the lower Mississippi River. The color range is from pure white to violet, and in some forms the blossoms are held well above the leaves. Some in this group are dwarfs only a few inches in height. All of the Louisiana irises hybridize freely, and some of the finest varieties clearly show *I. foliosa* blood. These always prove hardy under garden conditions.

Iris giganticaerulea

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Courtesy of the author

Rose of Abbeville, a warm rose hybrid (Peggy Mac × Old Coral)

Iris giganticaerulea usually lives up to its name in size and color, the huge lavender-blue flowers held on 3- to 6-foot stems. It, too, varies greatly from the type, both in form and color. Many pure whites have been collected in the wild, the prettiest of which was given the name Jeune Fille. The blues and lavenders range from the daintiest pastel shades to rich deep violet. There are several rose-pink varieties, and one is sulphur yellow.

At first, many of the collected varieties were so lovely that one thought only of saving these from oblivion, for so many of the bogs were being drained and cultivated, or filled in for building operations. What could be more striking than New Orleans, a huge rose-pink, of loose but graceful form? Mary Debaillon, delicate orchid-pink, is equally large. Contrast is not so large, but is a striking bicolor.

Excitement grew when new bogs were discovered near Abbeville, with clumps of brilliant reds and yellows, some of the flowers measuring 6 and 7 inches across. Some of these were so fine they were given names: rich yellows, Delta Treasure, Reflected Light, and Forsythia; clear crimson, Bayou Vermilion; velvety deep violet, Haile Selassie. In addition to their wonderful color, these Abbeville irises are proving to be tough and hardy. Up to this time, Haile Selassie is probably the best all-round garden iris among the natives.

Hybrids

After some years, a few soft pinks appeared in chance seedlings in gardens. The thought of *planned* crosses ran in many minds. At first the hybridizing was rather amateurish, but a few trained horticulturists among us taught us what "a controlled hybrid" really meant. With all the care in the world results cannot be guaranteed, for a seedling may be a throw-back to a remote ancestor. Already some fine things are emerging. Cherry Bounce and Plum Good are firm rich reds; Woodland Charm and Thistle Harmony are big beautiful bicolors, and Helen Smith, Dixie Deb, and Sally's Sunshine are clear yellows of firm flat form. The last three all have Kræmer Yellow for one parent.

A striking development in many of these hybrids is the big brilliant yellow signal-patch. Caddo, Royal Gem, The Khan, and several others show this feature to a marked degree. Lockett's Luck, a collected variety, is marked with a big yellow wedge; and Bayou Sunset, an uncontrolled garden hybrid, has a signal-patch so large it covers half the sepal. J. K. Small also displays this striking feature.

Saucy Minx, the rose-red offspring of Cajan and New Orleans

New Orleans, a collected variety

There seems little left to be attained in the way of color, and very nearly perfect form has been produced, so hybridizers are beginning to think of other things: hardiness, floriferousness, branching, foliage. There is work here for the serious hybridizer.

Culture

In growing these irises, the most important thing to be remembered is that they want culture quite different from that required by the tall bearded, and some other strains. They revel in a rich, moist, acid soil, with lots of humus. They are gross feeders, and can take care of a vast amount of well-rotted manure. From the beginning of the growing season till after blooming, they must have plenty of water. During summer, they may be allowed to go dormant, but the sun should not strike the tender rhizomes. In the South, they do best when planted where they get full sun only until noon. In cooler climates they will take all the sunshine they can get. Their resistance to cold is astounding. With light winter protection, they are being successfully grown in northern Minnesota and New England. A few gardeners are flowering them in southern Canada!

In these few short years, Louisiana irises have circled the globe—they are growing in Australia. For sheer grace, they are equaled by no other iris.

Worth Reading

A SELECTED LIST OF RECENT NONTECHNICAL BOOKS, MAGAZINE ARTICLES, AND EXPERIMENT STATION BULLETINS

General

A HISTORY OF HORTICULTURE IN AMERICA TO 1860, by U. P. Hedrick. Published by Oxord University Press, New York, 1950. 561 pages. $7.50.

Development of flowers, fruits, and vegetables in the whole United States, beginning with the time of the Indians. Material arranged chronologically and geographically. Influence of the colonists' need for food on the development of experimental horticulture and plant breeding by amateurs and by professional botanists. Continuation of the work by Washington, Jefferson, and others. Plant explorers and botanic gardens; fashions in foods and flowers; herb gardens, Quaker gardens, orchards, truck farming. Development of landscape gardening in relation to the local architecture of the times. Little biographies of important nurserymen. Horticultural societies and 160 years of horticultural literature.

THE COMING OF THE FLOWERS, by A. W. Anderson. Published by Williams and Norgate, London, 1950. 267 pages. $1.50.

How the common flowers and shrubs were first introduced into gardens.

Gardening and Landscaping

THE COMPLETE GARDEN HANDBOOK, by Maron J. Simon and others. Published by D. Van Nostrand, New York, 1950. 463 pages. $5.

Garden planning, selection of plants, preparing the ground, starting early plants in cold frames. Fruits and vegetables, trees, shrubs, lawns, flowers. Specific directions for important plants. Plants for the house and flower arrangements. Pests and diseases. Maps, charts, drawings, and color illustrations.

THE HOME LANDSCAPE, by Harold O. Perkins. University of Connecticut (Storrs), College of Agriculture Extension Service Bulletin 421. 24 pages.

Planning for use and beauty: basic design (the three areas); planting with a purpose.

HOW TO BUY FRONT-YARD PLANTING, by M. E. Bottomley, Thomas J. Baird, and Oliver Ester. In *The American Home,* April, 1950. 5 pages.

Selection and use of plants; planting plans; "before and after" illustrations.

HOW TO LANDSCAPE YOUR GROUNDS, second edition, by Loyal R. Johnson. Published by A. T. De La Mare, New York, 1950. 266 pages. $3.50.

Planning, locating the house, walks, lawns, soil; flower, rock, and wild gardens; trees and shrubs; pruning; lists of plants by Alfred C. Hottes; planting plans for all sections of the country.

WALLS CAN BE BEAUTIFUL, by Dorothy Ebell Hansell. In *Horticulture,* Feb., 1950. 1⅓ pages.

Building the wall; selecting plants; planting an established dry wall.

MALEIC HYDRAZIDE, by David G. White. In *Flower Grower,* Sept., 1950. 3 pages.

A new step in plant growth control, still in the experimental stage: killing crab grass; slowing down the growth of lawn grass and hedges; delaying the flowering of strawberries, raspberries, and possibly tree fruits; preventing the sprouting of potatoes in storage.

THE WEEKEND GARDENER, by Dorothy H. Jenkins. Published by Rinehart, New York, 1950. 286 pages. $2.75.

For the amateur or experienced gardener who hasn't much time to spend outdoors. Tools; soils; planning, planting, and management of various types of gardens with many kinds of plants.

SIMPLE ROCK GARDENING, by A. J. Macself. Published by Transatlantic Arts, Forest Hills, New York, 1949. 120 pages. $1.80.

For beginners with small gardens. Construction and maintenance. Alphabetical lists of plants suitable for the novice and of choicer ones for the enthusiast.

FOUNDATION PLANTINGS ABOUT THE HOUSE, by Donald J. Bushey. Cornell University (Ithaca, New York) Extension Bulletin 778. Jan., 1950. 31 pages.

What to plant and what not to plant in different places, with diagrams. Lists of vines for trellises and for walls, ground covers, and shrubs and trees of various sizes.

THE PROPAGATION OF PLANTS, by E. J. King. Published by Hutchinson's, London, 1950. 264 pages. $2.25.

For amateur and professional. Methods described and the reasons for them explained.

HOW TO BUILD GARDEN STRUCTURES, by Henry B. Aul. Published by Sheridan House, New York, 1950. 384 pages. $3.50.

Fireplaces, shelters, arbors, benches, fences, gateways, walls, walks, steps, terraces, curbings, pools, fountains. Drawings, plans, and explanations.

Trees, Shrubs, and Vines

HOW TO CHOOSE TREES, by Mary Deputy Lamson. In *House & Garden,* Jan., 1950. 4½ pages.

Types suitable for various places and uses.

HAWTHORNS FOR YEAR-ROUND ACCENT, by Philip L. Robinson. In *The Home Garden,* Jan., 1950. 5 pages.

Small, sturdy trees with beautiful flowers, fruit, and form; good as lawn specimens, hedge plants, or screen material.

THE HOLLY TREE, by Earle Dilatush. In *Flower Grower,* Aug., 1950. 2 pages.

Uses, culture, varieties.

CARE OF EVERGREENS, by Charles H. Connors. New Jersey Agricultural Experiment Station (New Brunswick) Circular 533. Feb., 1950. 16 pages.

Culture, pruning, insects, diseases, sprays.

PROPER TREE PRUNING, by F. A. Bartlett. In *Horticulture,* Jan., 1950. 1½ pages.

When, how, and why.

FIRST AID TO STORM-INJURED TREES, by E. L. Kammerer. *Morton Arboretum Bulletin of Popular Information* (Lisle, Ill.), March, 1950. 4 pages.

Promptness of treatment, safety for man and tree, fertilizer as an aid to recovery, preventive measures.

IS YOUR TREE SURGEON A QUACK? by Joel Parkes. In *Better Homes & Gardens,* May, 1950. 1 page.

How to find a reputable one.

TWELVE SELECT SHRUBS, by E. L. Kammerer. *Morton Arboretum Bulletin of Popular Information* (Lisle, Ill.), Feb., 1950. 4 pages.

A list for those wishing to limit plantings to the best materials available.

RHODODENDRONS, by F. Kingdon-Ward. Published by Pellegrini and Cudahy, New York, 1950. 128 pages. $2.50.

What the amateur grower needs to know. Cultivation and propagation. Tree and shrub kinds. Dwarfs for rock gardens, for edging, and for bedding. Azaleas, greenhouse rhododendrons, hybrids. Choice of kinds.

A HEDGE IS AS GOOD AS THE MATERIAL IT'S MADE OF, by Donald Wyman. In *House & Garden,* Sept., 1950. 3 pages.

A discussion of the various purposes of hedges; their height, width, and spacing; cutting back at planting time; shearing or trimming. Thorny barriers; hedges for difficult situations; flowering, low, tall, and lazy man's hedges.

AMERICAN SHRUBS FOR AMERICAN GARDENS, by Caroline Dormon. In *Flower Grower,* Feb., 1950. 3 pages.

Where and how to grow evergreen and deciduous kinds.

CAMELLIA GROWING, by R. J. Wilmot. University of Florida (Gainesville) Agricultural Extension Bulletin 142, April, 1950. 19 pages.

History, classification (illustrated), propagation, planting, fertilization and culture, pests.

THE FORSYTHIAS, by Donald Wyman. Arnoldia, April 14, 1950. 8 pages.

Leaf key, chart of size and color of flowers, notes on species and varieties.

TWENTY-SIX LILACS, by Ralph W. Curtis. In *The Cornell Plantations*, spring, 1950. 3½ pages.

Classified by color and time of bloom. What to do with them.

LET'S GO SHOPPING FOR ROSES, by Ray C. Allen. In *The American Home*, March, 1950. 2½ pages.

How to choose plants; chart of height, form, habits, uses, assets, liabilities.

USE YOUR BEST ROSES FOR WHAT THEY DO BEST, by F. F. Rockwell. In *The Home Garden*, Feb., 1950. 7 pages.

For cutting, landscape effect, or both.

SHRUB ROSES, by G. S. Thomas. In *Journal of the Royal Horticultural Society*, Jan., 1950. 6½ pages.

Kinds and uses.

PRUNING FOR BETTER ROSES, by E. A. Piester. In *Popular Gardening*, March–April, 1950. 3 pages.

How and how much to prune the various kinds; illustrations.

MULTIFLORA ROSE FOR LIVING FENCES AND WILDLIFE COVER, by Wallace L. Anderson and Frank C. Edminster. United States Department of Agriculture Leaflet 256, June, 1950. 8 pages. 5 cents.

How to plant and care for it.

ORNAMENTAL WOODY VINES FOR THE SOUTHERN GREAT PLAINS, by E. W. Johnson. United States Department of Agriculture Farmers' Bulletin 2015, July, 1950. 24 pages. 10 cents.

Selection, planting, care, and uses of twenty-five kinds for this problem area.

CLEMATIS FOR COLLECTORS, by Ava Woodworth Jones. In *The American Home*, Nov., 1949. 3 pages.

Species, varieties, care.

SOME WOODY-STEMMED GROUND COVERS, by J. H. Beale. In *Journal of The New York Botanical Garden*, March, 1950. 3½ pages.

For sun and for shade—but not Japanese honeysuckle!

Native Plants

HOW TO KNOW THE WILD FLOWERS, by Alfred Stefferud. Published by Henry Holt, New York, 1950. 144 pages. $2.

For beginners. Flowers arranged by families, also listed by habitats. Drawings of flowers and diagrams of parts.

WILD FLOWERS, by W. R. Philipson. Published by Adam and Charles Black, London (Macmillan, New York agent), 1950. 96 pages. $1.25.

British flowers arranged by families. Descriptions in readable style. Photographs and color plates.

WILD FLOWERS AT A GLANCE, by M. C. Carey, with drawings by Dorothy Fitchew, and introduction by Henry K. Svenson. Published by Pellegrini and Cudahy, New York, 1950. 281 pages. $2.75.

Flowers arranged by color, with a color illustration of each one. British wild flowers, many of which grow along roadsides and in fields in the United States and Canada.

A NATURAL HISTORY OF TREES OF EASTERN AND CENTRAL NORTH AMERICA, by Donald Culross Peattie. Published by Houghton Mifflin, Boston, 1950. 618 pages. $5.

Trees arranged by families, with keys for identification, descriptions, and drawings. Uses, folklore, history, famous trees.

TREE TRAILS AND HOBBIES, by Ruth Cooley Cater. Published by Doubleday, New York, 1950. 346 pages. $3.50.

A book to read, to learn about trees.

SHRUBS OF MICHIGAN, by Cecil Billington. Cranbrook Institute of Science Bulletin 20, second edition, 1949. 346 pages. $4.50.

For the layman. Plants arranged by families. Keys for identification, drawings, and distribution maps.

MUSHROOMS IN THEIR NATURAL HABITATS, by Alexander H. Smith. Published by Sawyer's, Portland, Oregon, 1949. 636 pages. $26.50.

A new approach; combines the advantages of a trip to the woods with a specialist, and a careful treatise. Mushrooms in relation to other organisms; edible and poisonous kinds; collecting and preparing specimens; study with and without a microscope; key for identification; description of each species; growing and cooking. Stereo-photographs in full color, of 231 species.

Food Plants

THE HOME FRUIT GARDEN, revised by A. C. Bobb. University of Connecticut (Storrs), Agricultural Extension Bulletin 354. May, 1950. 24 pages.

Varieties and culture; small fruits and tree fruits; pests; literature.

PROPAGATION OF FRUIT TREES BY BUDDING AND GRAFTING, by T. J. Talbert. University of Missouri (Columbia) Agricultural Experiment Station Circular 343. March, 1950. 16 pages.

Principles, time, methods (illustrated).

TREE CROPS, A PERMANENT AGRICULTURE, by J. Russell Smith. Published by Devin-Adair, New York, 1950. 416 pages. $6.

For anyone with a plot large enough to plant a tree. Nut trees for every climate and soil, especially in hilly and rocky places and places where rainfall is low. Nut trees for immediate income and for old age insurance; for food for man and beast, and for industrial use.

HOME GROWN CHESTNUTS, by John W. McKay. In *Horticulture*, June, 1950. 1 page.

Promised by three new Chinese varieties.

HOW TO GROW PERSIMMONS, by Kan Yashiroda. In *Horticulture*, July, 1950. 1⅓ pages.

For ornament and for fruit.

THE MAPLE SUGAR BOOK, by Helen and Scott Nearing. Published by John Day, New York, 1950. 281 pages. $3.75.

Ancient and modern practice in sugaring. Homesteading and making a living from the maple.

RECIPES FOR USING SOYBEANS, WITH DIRECTIONS FOR GROWING IN THE HOME GARDEN, by Frances O. Van Duyne. University of Illinois, College of Agriculture Extension Circular 662. June, 1950. 16 pages.

Why they should be used; varieties and culture directions.

TIPS ABOUT STRAWBERRIES, by Melvin Kolbe, C. F. Bishop, and John D. Downes, Jr. West Virginia University (Morgantown) Agricultural Extension Circular 354. Jan., 1950. 20 pages.

When, where, and how many to plant, and how to take care of them.

RASPBERRIES AND BLACKBERRIES IN YOUR GARDEN, by George L. Slate. In *Horticulture*, April, 1950. 2 pages.

Varieties and culture.

THE MELON STORY, by F. F. Rockwell. In *The Home Garden*, June, 1950. 5 pages.

From seed to freezer. Photographs and cultural directions.

MUSHROOM GROWING TODAY, by F. C. Atkins. Published by Macmillan, New York, 1950. 187 pages. $2.50.

By amateurs: in lawns, cellars, boxes, and flower-pots; by nurserymen and market gardeners: outdoors or in greenhouses; by specialists.

THE HERB GROWER'S COMPLETE GUIDE, by Rosella F. Mathieu. Published by the author at Fragrant Herb Farm, Silverton 13, Ohio, 1949. 95 pages. $2.

A source book for those who use and grow herbs. History and general culture. Descriptions and specific directions.

AN AMERICAN HERB CALENDAR FOR 1951, by Elizabeth Wade White and Prentiss Taylor. Published by The Herb Grower, Falls Village, Connecticut, 1950. 14 pages. 50 cents.

Quotations, drawings, and reminders of gardeners' tasks.

Lawns

WHAT YOU SHOULD KNOW ABOUT LAWNS, by Chan W. Baker. In *House & Garden*, Sept., 1950. 3 pages.

Selection of grass, seedbed preparation, sowing, feeding, and cutting.

LAWN CARE CALENDAR, by Walter S. Lapp. In *Horticulture*, April, 1950. 2 pages.

Mowing, watering, fertilizing, repairing, rolling; weeds, insects, shade, crab grass.

NEW GRASSES—WITH LESS WORK—PROMISE A PERFECT LAWN, by R. Milton Carleton. In *Better Homes & Gardens*, March, 1950. 1 page.

Probably available in 1952 or 1953.

Diseases and Pests

THE PLANT DOCTOR, third edition, by Cynthia Westcott. Published by J. B. Lippincott, New York, 1950. 231 pages. $3.

Symptoms of plant troubles in the ornamental garden; preventives and cures, and how, when, and why to use them. In calendar form for the vicinity of New York, with discussion of regional problems of other parts of the country. Alphabetical list of plants, diseases, apparatus; definitions.

BASIC FACTS OF INSECT PEST CONTROL, by Louis Pyenson. In *Flower Grower,* April, 1950. 3 pages.

Pests classified by feeding habits (sap-feeding, chewing, boring, etc.) and by kinds of plants they attack (flowers, vegetables, lawns, evergreens, deciduous trees and shrubs). Control program in chart form—kind and amount of material, and time.

PLANT DISEASE HANDBOOK, by Cynthia Westcott. Published by D. Van Nostrand, New York, 1950. 756 pages. $7.50.

Identification, prevention, and control of diseases of vegetables (except field crops) as well as ornamental plants. Technical information organized for easy reference. For professional and amateur gardeners.

DISEASES AND INSECTS OF THE FLOWER GARDEN AND THEIR CONTROL, by R. S. Kirby and J. O. Pepper. Pennsylvania State College (State College, Pa.) Agricultural Extension Circular 347. Nov., 1949. 31 pages.

Materials, dilution table, and equipment for taking care of seventeen kinds of plants.

HUNGER SIGNS IN CROPS (second edition), a symposium by Firman E. Bear and others. Published by The American Society of Agronomy and The National Fertilizer Association, Washington, D. C., 1949.

Why plants starve. Color illustrations and keys for recognition of deficiency symptoms in vegetables, fruits, grains, and other crops.

DDT: ITS EFFECTS ON BENEFICIAL LIFE, by J. P. Linduska. In *Bulletin of the Garden Club of America,* Jan., 1950. 7 pages.

A discussion of the problem of the hazards of using this insecticide outdoors.

OAK WILT IN WISCONSIN, by J. E. Kuntz and A. J. Riker. University of Wisconsin (Madison) Agricultural Experiment Station Stencil Bulletin 9. March, 1950. 11 pages.

Cause, symptoms on the different species that are susceptible, transmission, possible means of control. Other states affected.

WHAT'S HAPPENING TO OUR SHADE TREES? by Rush P. Marshall. In *Popular Gardening,* Sept.–Oct., 1950. 2⅓ pages.

Prevent diseases by keeping the trees growing vigorously.

Annuals, Perennials, and Bulbs

ANNUALS, revised edition, by Roy Hay. Published by The Bodley Head, London (Macmillan, New York agent), 1950. 240 pages. $2.50.

For amateur or professional. Origin, history, culture, uses. Plants arranged alphabetically.

PAINT GARDEN PICTURES WITH ANNUALS, by R. Milton Carleton. In *Popular Gardening,* March–April, 1950. 3 pages.

Where and how to use the various colors, heights, and forms for bloom from frost to frost.

PRIMULAS IN THE GARDEN, by Kenneth C. Corsar. Published by Lindsay Drummond, London, 1949. 151 pages. $1.80.

For the amateur. Based on twenty-five years' experience. Kinds for rock garden, border, wild garden, waterside, and greenhouse. Photographs of many kinds.

PHLOX IN YOUR GARDEN, by Martha Pratt Haislip. In *The Home Garden,* Aug., 1950. 8 pages.

For sustained color, spring to fall. Chart of color, height, and miscellaneous notes.

GRACEFUL, CHEERFUL COLUMBINES, by Montague Free. In *The Home Garden,* Nov., 1949. 6 pages.

Kinds for the flower garden and for the rock garden; culture, propagation, and pests.

THE PROPAGATION OF ALPINES, by Lawrence D. Hills. Published by Faber and Faber, London, 1950. 464 pages. $3.

For all gardeners who grow alpines, from the beginner to the expert. Methods described in detail for 2,500 kinds of plants. Division, seed, cuttings, root cuttings, leaf cuttings, and layering. Limitations and advantages of recent developments.

FALL ASTERS, by Mary C. Seckman. In *Popular Gardening,* Sept.–Oct., 1950. 3 pages.

Culture and kinds; chart of color, height, and blooming season.

CHRYSANTHEMUMS FOR PLEASURE, second edition, by Ernest L. and Aleita H. Scott. Published by the authors, 64 South St., Bogota, N. J., 1950. 327 pages. $5.

A practical book for amateur and professional. History, classification, soil, mulches, pests, diseases, seasonal care, propagation, disbudding, chart of dates for the final pinch, breeding, greenhouse culture. Illustrated.

SPOTLIGHT ON DAYLILIES, by E. J. Kraus. In *Flower Grower,* July, 1950. 4 pages.

For long blooming season, easy culture, and a variety of colors.

IRIS FOR YOU, by Sam Caldwell. In *Flower Grower,* May, 1950. 3 pages.

Kinds for every gardener; how to get the most out of them.

WATERLILIES FOR YOUR POOL, by George H. Pring. In *Flower Grower,* June, 1950. 5 pages.

Directions for planting these dependable aquatics (with illustrations), and for pool maintenance. Suggested varieties classified by color and hardiness.

SOME INTERESTING PERENNIALS FOR THE HOME GROUNDS, by A. O. Rasmussen. Pennsylvania State College, State College, Pa. Agricultural Extension Circular 370, Oct., 1950.

Planning, planting, propagation, varieties.

PORTFOLIO OF SPRING BULBS: Crocus and Muscari. In *The National Horticultural Magazine,* April, 1950. 31 pages.

Pictures of twenty-eight species and varieties, with culture notes.

SPRING FLOWERS, by Arlette Davids, with introduction by Princesse Bibesco. Published by Hyperion (Macmillan, New York agent), 1948. 35 pages. $3.50.

A folio volume of thirty-two full-page reproductions of water colors. Tulips, hyacinths, lilies, begonias, gloxinias, and others.

BULBS FOR SUMMERTIME, by F. F. Rockwell. In *The Home Garden,* May, 1950. 6 pages.

Easily grown and good for cutting; tall ones for accent, some for shade, some for pots and borders.

FORTY DAFFODILS EVERY GARDENER SHOULD OWN, by Jan de Graaff. In *Popular Gardening,* March–April, 1950. 5 pages.

Why they will make the best showing.

HOW WE GARDEN WITH LILIES, by Forrest and Lydia Kendall. In *The Home Garden,* Oct., Nov., Dec., 1950. 20 pages.

Three articles on selection, use, and care.

NEW LILIES FOR YOUR GARDEN, by Jan de Graaff. In *Flower Grower,* Aug., 1950. 3 pages.

Endless variety of hybrids.

TRUMPET LILIES, by Jan de Graaff. In *Popular Gardening,* Sept.–Oct., 1950. 3 pages.

Important kinds, when they bloom, and how to grow them.

LILIES FOR GARDEN AND GREENHOUSE, revised edition, by D. T. Macfie. Published by W. H. and L. Collingridge, London, 1947. (Transatlantic Arts, New York agent.) 151 pages. $2.75.

A practical book. Bulbs, roots, soil, planting, culture, propagation. Alphabetical list of the best garden lilies, with descriptions and culture directions. Selections for various purposes, including greenhouse culture.

Indoor Gardening

FOR REAL HOUSE PLANT BEAUTY, GROW GLOXINIAS, by Albert H. Buell. In *Flower Grower,* Nov., 1949. 3 pages.

How to do it well.

REX BEGONIAS, by Ernest K. Logee. In *Flower Grower,* Dec., 1949. 3 pages.

Unequaled among foliage plants for the house.

SUCCULENTS ARE THE CAMELS OF THE PLANT WORLD, by T. H. Everett. In *House & Garden,* Oct., 1950, 3 pages.

How to grow them in the house,

GROWING GERANIUMS AS HOUSE PLANTS, by H. M. Biekart. New Jersey Agricultural Experiment Station (New Brunswick) Circular 530. Sept., 1949.

Methods and varieties.

GARDEN IN YOUR WINDOW, by Jean Hersey, with foreword by Richardson Wright. Published by Prentice-Hall, New York, 1949. 283 pages. $3.

Easy indoor gardening for everyone, with detailed instructions for a dozen different plans, including many unusual plants and containers.

HOME ORCHID GROWING, by Rebecca Tyson Northen. Published by D. Van Nostrand, New York, 1950. 292 pages. $6.

Primarily for the beginner, but useful also to the experienced grower. Methods for house and greenhouse explained and illustrated. Buying seedlings or raising and sowing seeds.

ORCHIDS, THEIR DESCRIPTION AND CULTIVATION, by Charles H. Curtis. Published by Putnam, London, 1950. 280 pages. $12.85.

Scientific information for the expert and simple guidance for the beginner. Description and culture of more than 1500 kinds. Full-page illustrations in black and white and in color.

BULBS FOR BEGINNERS, by Alfred Putz. In *House & Garden,* Oct., 1950. 1½ pages.

For winter bloom in the house. Diagrams.

THE GREENHOUSE FOR THE SMALL GARDEN, by Frederick B. Barns. In *Journal of the California Horticultural Society,* Jan., 1950. 3 pages.

How to plan one: location, size, materials (wood, glass), ventilation, humidity, heat, shading.

USE YOUR CELLAR DOORWAY, by Sue Maxwell. In *Horticulture,* Nov., 1949. 1 page.

For an inexpensive greenhouse; its advantages and how to build it.

AFRICAN VIOLETS FROM SEED, by Alma Wright. In *Flower Grower,* Nov., 1949. 3 pages.

Interesting because of variation, especially if different kinds are crossed.

CASCADE CHRYSANTHEMUMS, by John L. Creech. In *The National Horticultural Magazine,* Jan., 1950. 4 pages.

Growing and training pliable-stemmed chrysanthemums for trailing showers of bloom.

THE BIZARRE BROMELIADS, by Mulford and Racine Foster. In *Flower Grower,* Feb., 1950. 3 pages.

Ideal house plants.

THE WATER-CULTURE METHOD FOR GROWING PLANTS WITHOUT SOIL, by D. R. Hoagland and D. I. Arnon, revised by D. I. Arnon. University of California (Berkeley) Agricultural Experiment Station Circular 347. Jan., 1950. 32 pages.

General principles, unfounded claims, proper use, directions.

ENGAGEMENT RECORDS, by Mineko Chigira. Published by M. Chigira, 890 Motofuto St., Urawa City, Japan, 1950. Printed in Occupied Japan by Kyodo Printing Co., Tokyo. 112 pages. $1.50.

Calendar for 1951, with a picture of a Japanese flower or Bonsai arrangement for each week.

Pest Plants

POISON IVY AND ITS CONTROL, by Dale E. Wolf and Gilbert H. Ahlgren. New Jersey Agricultural Experiment Station (New Brunswick) Circular 532. Feb., 1950. 4 pages.

Recognition and eradiction of the plant; prevention and treatment of poisoning.

RAGWEED AND ITS CONTROL, by Dale E. Wolf and Gilbert H. Ahlgren. New Jersey Agricultural Experiment Station (New Brunswick) Circular 535. April, 1950. 4 pages.

Two kinds illustrated; when and how to use 2,4-D, and precautions.

Soil

PLANT FOODS FOR THE GARDEN CUPBOARD. In *The Home Garden,* Feb., 1950. 3 pages.

Fertilizers: what they do and how to use them, with information in chart form.

THIS "ORGANIC GARDENING" BUSINESS, by Ray Koon. In *Horticulture,* May, 1950. 1 page.

"The secret of successful farming and good gardening is the maintenance of a proper balance between organic materials and chemical fertilizer."

YOUR GARDEN SOIL, by Alex Lauric. In *Flower Grower,* March, 1950. 2 pages.

What it is, how it functions, why it needs care.

WITHIN THE BROOKLYN BOTANIC GARDEN

STORM DAMAGE

The hurricane-like winds accompanying the storm that arrived in Brooklyn on the Saturday after Thanksgiving blew down the long pergola at the north end of the Cranford Rose Garden and one of the ten smaller pergolas in the Osborne Memorial. Over thirty-five trees were uprooted, blown down, or seriously damaged. Some, such as the 20-foot hemlock near daffodil hill, were put in an upright position and guyed with strong wires. Some require much high pruning to remove the jagged stumps of limbs torn from the trees during the gale.

Many of the poplars on the border mound were completely destroyed. These were planted in the early days of the Garden for quick growth that would screen out the city. In this manner the poplars performed nicely; but now there are more desirable, permanent trees to take their place.

The most serious losses in the storm were three noteworthy specimens: a large Osage-orange (*Maclura pomifera*), a white ash (*Fraxinus americana*), and a red mulberry (*Morus rubra*). These can be replaced with younger trees, but the thirty-five or forty years of growth which gave the destroyed trees their elegance cannot be replaced.

Compared with the hurricanes of 1938 and 1944, the Garden suffered little damage in the recent storm. A tree has a much greater chance of survival in strong winds when it is denuded (with the leaves off the branches) than when it is completely garbed in summer foliage.

DIRECTOR HONORED

On October 25, 1950, at the University of British Columbia, the honorary degree of Doctor of Science was awarded to Dr. Avery "whose appointment at a remarkably early age to his present position as Director of the Brooklyn Botanic Garden is a tribute to his outstanding qualities as investigator, teacher, author, and administrator. His pioneer work in the study of plant hormones, his direction of fundamental studies in related fields, and his successful use of the Brooklyn Garden to stimulate both popular and basic studies, have gained him wide recognition in the combined fields of science and education. In honoring him the Senate of this University acknowledges the value of his researches, the inspiration of his teaching, and the zeal and devotion with which he has pursued his botanical investigations in many countries from 'the tree which grows in Brooklyn' to the dwarfed evergreens of the Lapland tundra."

GIFT OF TULIP BULBS

A shipment of tulip bulbs was provided by the Associated Bulb Growers of Holland in recognition of the many parcels of clothing sent by Brooklyn school children to Breukelen, the Borough's namesake in Holland. These bulbs were planted in the Brooklyn Botanic Garden November 9, 1950.

Present at the planting ceremony were: a delegation of school children; representatives of garden clubs; Miss Marguerite A. Salomon, founder and director of the "Brooklyn adopts Breukelen" project; and the Director of the Garden.

The tulips are in a new border planting near the Rock Garden. Included in the planting are 2,000 tulips of more than 20 varieties and many colors—reds, yellows, pinks, whites, and purples. This international gift will flower next May.

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Corrections:

p. 54: second column, fourth line, after "seeds" insert "without sexual union" (with apologies to Mr. Teuscher).
p. 179: last line of first paragraph, for "unleavened" read "leavened."
p. 180: first line of footnote, for "one hundred fifty" read "two hundred fifty-one."
p. 187: legend for upper left-hand figure, for "plum curculio" read "apple maggot"; legend for upper right-hand figure, for "scale" read "scab" (with apologies to Mr. Southwick).

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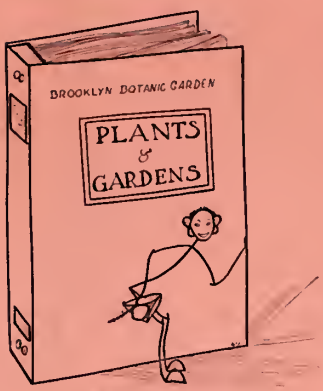

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